

GREEN GROWTH: PARADIGM SHIFT OR BUSINESS-AS-USUAL?

by

Yoonhee Ha

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Energy and Environmental Policy

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ABSTRACT

This dissertation seeks to clarify the appropriate economic development paradigm that can be applied to solve diverse challenges and crises bedeviling modern global society. These crises include climate change, environmental degradation, resource depletion, stagnation in growth, widening inequality gap between the rich and the poor leading to social polarization, and the deterioration in quality of life, among others. Global society including leading international agencies and inter-governmental groups embraced Green Growth as a new economic paradigm to address these challenges without harming its economic development. The economic blueprint was premised on developing a new economic architecture that would make material expansion possible without sacrificing the environment. In this regard, the developed world could obtain a new growth engine utilizing its advanced green technologies while developing countries could find a means to decouple their economic development from the deterioration of the ecosystem. At the time of its launch, the paradigm was accepted as revolutionary, both for its ethics and its efficiency. For this reason, Green Growth has been regarded as a paradigm shift. However, doubts have emerged as to whether Green Growth is indeed this paradigm shift. Does it resolve the current conflict between economic growth and the environment; does it reintroduce an ethical perspective in addressing the relationships between peoples and their governments or between humanity and the natural world as would be necessary of any true paradigm shift?

In this dissertation, I analyze Green Growth in terms of a logical conceptual paradigm shift from the currently prevalent exemplar that resulted in the modern anomalies discussed above. The theoretical framework is based on Thomas Kuhn's 'paradigm shift' theory. According to Kuhn, the closing of a crisis happens in three ways. The first option is when normal science ultimately proves able to deal with the crisis-provoking problem. A second path occurs when the crises resists even the most radical measures and scientists conclude that no solution will be forthcoming in the present state of their field and so defer the problem to a future generation who have more advanced skills and tools. The last possibility is that the crises bring forth a new paradigm and the battle over its acceptance then begins (Kuhn, 1996). A review of the diverse literature on the subject shows that a paradigm shift occurs when there is a transformation in society's belief system and power structure (Hollinger, 1973; McDonagh, 1976; Dolfsma & Welch, 2009). In order to verify this shift, I use a number of diverse methodologies. The core methodologies provide a characterization of the current Progress Paradigm and Green Growth, and analyze a case study of South Korea's Green Growth Initiative.

This study seeks to assess the claim that Green Growth constitutes a paradigm change. It determines whether any change has occurred in the values and power structure of society having political, economic, and ethical criteria. Positivist science, which has been the predominant influence on social thought throughout the modern era, maintains that rational outcomes can only be obtained through value neutrality. However, this study's understanding of political economy and ethics borrows from an alternative academic tradition of what some have called "value rationality" or "phronesis". To this end, Flyvbjerg (2001) suggests that social science ask four key

questions: Where we are going? Who gains and who loses by this choice? Is this desirable? And what is to be done?. This study uses three questions of *phronesis* analysis as the basis of its investigation into the validity of the so-called paradigm shift represented by Green Growth policy and institutional development. It comments on but does not address at length the question of what is to be done.

A core task of this study is to establish criteria for comparing two paradigms. To this end, five core characteristics of the current Progress Paradigm are identified. In the current Progress Paradigm: (1) material growth is seen as progress *per se*, (2) technological optimism reigns, (3) government functions must meet market demands, (4) there is a predominant belief in human mastery over nature, and (5) power and authority are possessed by experts and bureaucrats. The study also discusses the characteristics of Green Growth, which was proposed as a new paradigm by its proponents.

On the basis of the characterization of the Progress Paradigm and Green Growth as a paradigm candidate, the study attempts to verify whether a paradigm shift is likely at the theoretical and policy levels. The Korean case is a good model for the Green Growth study regarding a possible policy shift since its green principles were embedded in every sector of the economy. The government mobilized political, economic, social, and administrative resources to ensure successful implementation of the Green Growth initiative. The motivation for the full implementation of the economic blueprint stems from a desire for the country to emerge as a strong global economic leader. Of the major countries that sought to implement the Green Growth strategy, the Korea Green Growth Initiative (KGGI) was outstanding, principally due to the country's tradition of government-led economic development (though market-

led growth has expanded its scope after the IMF bailouts in 1997 and 1998). For this case study, I conducted in-depth interviews with Korean senior government officials who were deeply involved in the implementation of the KGGI. In addition, I analyzed a myriad of documents including official government papers and press releases, business proposals, reports by the civil society, publications by national research institutes, press reports, memoirs or books of key persons, etc.

The study consists of two parts. The first part is a theoretical analysis that covers chapters 2 to 6. This part encompasses the study's theoretical framework, the characterization of the current Progress Paradigm, and the characterization of the candidate paradigm Green Growth. The second part consists of a policy analysis that contributes to verifying whether Green Growth has resulted in a paradigm shift and policy change by analyzing actual policy programs introduced in the KGGI, such as the Korean permit trading system, the new energy regime of the KGGI, the 4 Rivers Restoration Project, the governance of the KGGI, and R&D directives.

Chapter 7 to 11, which form the second part of the study, parallel each section of chapter 4. For example, section 4.1 describes the first component of the PP (the belief in material growth as progress *per se*) and chapter 7 analyzes actual KGGI programs to determine if they are overcoming this ideology. The paradigm change analysis presented in these chapters focuses especially on whether the KGGI has altered the prevailing ideology and power structure, i.e., the core values and the winner/loser structure of society.

The analysis of the KGGI in chapters 7 to 11 leads to the conclusion that Green Growth has inherited the core elements of the PP. For this reason, it is difficult to view Green Growth as a paradigm that could solve the crises of modernity. The analysis of

the KGGI conducted in chapters 7 to 11 reveals that Green Growth reinforces key modern ideologies, such as an unwavering belief in material progress, technological optimism, and human mastery over nature. In addition, the governance through which Green Growth programs are administered does not differ meaningfully from the PP. Traditional power elites represented by bureaucrats and professionals still control decision-making processes and their decisions serve to further the interests of vested rights, specifically, businesses. In this way, Green Growth strengthens the coalition between the government and the market. In the programs designed to foster Green Growth, the main beneficiaries are always large businesses, who continue to be seen as the leading contributors to GDP growth, and therefore progress. Ordinary citizens remain the passive recipients of policies. Under this situation, the status of existing winners is hardly undermined and losers remain losers. Material growth is the prime objective of Green Growth, just as it was for the PP. There has been no change in priorities. One of the most powerful ideologies of modern society that equates material growth with progress *per se* still overwhelms other values. Newly emergent, largely non-economic values that promote, among other things, coexistence, diversity, civil engagement, and a better quality of life are not pursued for their own sake, but rather utilized to create new sources of material growth. Moreover, the policy analysis conducted in chapters 7 to 11 revealed that the KGGI failed to create significant policy change. A representative example was the Korean government's failure to normalize the price of electricity despite it being a key tool for solving the Korean energy crisis. Lastly, this study finds the possibility of paradigm change in a polycentric approach (Taminiau & Byrne, 2015) that focuses on promoting a more bottom-up system of governance and diversifying the agents that lead change.

Chapter 1

INTRODUCTION

Given the problems and risks of our time—environment, social, demographic; globally, locally—I suggest we consider whether we can afford to continue this fundamental weakness of modernity. (Flyvbjerg, 1998, p. 234).

1.1 Anomalies of Modern Political Economic Paradigms

Industrialism transformed humanity on a number of levels. Mass production and the technological revolution created a new type of economy that detached people from the land. Those who previously worked to provide for their own subsistence were forced to sell their labor to others as their livelihoods could not be maintained outside of the market system. Under industrialism, the market functions as a core distributor of resources. As market forces grew increasingly important to the average person's livelihood, the political economy of industrialism became a primary subject of modern economic thinkers. The characteristics of this political economy have changed several times as these thinkers have attempted to create appropriate governing systems for the industrial econ. In some eras, thinkers conceived of paradigmatic changes to the political economy to replace dominant "belief systems," while in others, evolutionary reforms were sought within the boundaries of the prevalent belief systems. However, none of these political economic metamorphoses have been very successful thus far in solving the "anomalies" that industrial societies have faced.

Despite continuous changes of the political economy, a focus on economic expansion has characterized each phase. In other words, even though neo-liberalist,

socialist, or Keynesian approaches have different perspectives on economic order, they each share the same perception that the expansion of the economic system leaves humanity better off and leads to progress on the larger scale. As noted by Heilbroner: “Economic growth [is] the central pillar of support for the sanguine views of Victorians, traditional Marxists, and managerialists alike ...” (1990, p. 17).

This conventional wisdom that economic growth always leads to human progress has been challenged by the presence of modern anomalies, such as global climate change, ecological destruction, continuous economic crisis, resource depletion, and social inequality. Warnings about the future of the growth-driven economy are expressed by numerous economic philosophers and international bodies, including Galbraith (1998), Heilbroner (1991), and Daly (1996). In light of recent economic crises and tensions over resources and climate, warnings about the present economic paradigm have become even more pronounced. The need for a paradigm shift is one of the most popular themes in the economic sustainability literature. However, what passes for a paradigm shift in this continually mutating political economy varies from one theorist to another. For example, while Daly argues for abandoning the economic ideology that regards the growth of GDP as an absolute value (1994), proponents of the increasingly popular Green Growth model of economic development—a model that presents itself as a new paradigm—still frames economic growth as essential for achieving human well-being. Initiatives that fall under the category of Green Growth commonly attempt to commensurate economic growth with environmental protection, although they have been formulated under a variety of names, modes, and contexts. More specifically, all Green Growth initiatives have been founded on a belief that environmental protection measures will make

economic growth sustainable, and thus help save the planet from ecological collapse (Ekins, 2000; Hubert, Gao, Mandell, and Zysman, 2011; UNESCAP, 2008; UNEP, 2011; Barbier, 2010; OECD, 2009). Unlike Daly, Green Growth advocates believe the source of contemporary anomalies can be traced to a particular economic growth path rather than seeing them as an inherent consequence of growth itself. As a result, it suggests that these anomalies can be resolved simply through changing the mode of production, the technology used, the institutions involved, and/or the business practices employed by the political economy.

Regardless of how one defines it, the preponderance of arguments in favor of a paradigm shift reflects the seriousness of the economic maladies that have arisen in the contemporary world. The crisis that humanity is facing is unprecedented. Humanity has to confront at least three major crises as a result of the accumulated problems of industrialization. The first is the ecological crisis that has occurred as a direct result of growth-driven industrialism. The industrialism that brought material affluence to Western society placed unprecedented pressure on the biosphere. However, despite the biosphere's limited capacity to absorb the level of economic activity made possible by industrialism (Georgescu-Roegen, 1988), it was believed that technological progress would solve the side effects of economic development (Ellul, 1964; Mumford, 1964). Yet the diversity and severity of ecological catastrophes that are ubiquitous across the globe are raising questions about the sustainability of humanity's material expansion. Recourse to technological solutions offers, therefore, limited prospects for widespread success in face of the constant emergence of new ecological problems and the persistence of severe and escalating ones.

Another serious problem is the ever-growing chasm between the rich and the poor (Byrne et al, 2002; Gold, 2010). This phenomenon has not been restricted to the jurisdiction of any one country. A report by Oxfam (Fuentes-Nieva and Galasso, 2014) stated that almost one-half of the world's wealth is owned by one percent of the population and that the combined wealth of the 85 richest individuals equals that of the poorest half of the world's population. The material wealth and political power disparities that exist inside and between countries has intensified in recent years and continues to thwart international attempts at addressing global catastrophes. Even in the wealthiest country, the U.S., inequality among working-age people has risen 25% since 1980. A story from the *New York Times* puts a human face on these numbers when it documents that “of the record 40,000 people in New York City’s shelters, a growing number belong to seemingly ordinary families, rushing off to school and work, smartphone in hand” (Feuer, February 5, 2012). Faced with the consequences that the growth dividend of industrialism is becoming increasingly diverted to wealthy elites, the rationale that economic growth is desirable on the grounds that it promotes broader prosperity is undermined.

Even more serious is the fact that humanity is losing the autonomy that makes it distinctive amongst the Earth's species. Globalized economic and governance systems deny humans their decision-making capacities and abilities to govern their own livelihoods. Mumford (1964) observed a “democratic-authoritarian bargain” that creates a system which controls and limits the creativity of humanity. In this system, humans sacrifice personality, historical context, and the chief purpose of their existence in exchange for material advantages in quantities hardly available even for a restricted minority in previous generations. Although the authoritarian aspects of

modernity have been concealed by institutionalized democracy, the reality of the political economy of modern democracy is being exposed through the flood of accumulating misfortunes. Further, each new problem compounds the effects of the previous ones.

In the midst of these crises, the ability of existing governance and economic systems to cope with the new issues is showing clear limitations. Governments do not have enough financial leverage to stimulate the economy. Even if governments can mobilize enough tax money to boost the economy, create employment, and design welfare programs, those prescriptions tend to be judged solely on numerical outputs and efficiency (Byrne, 1987), which serve to hide their true impact on the lives of human beings. These tendencies demonstrate the inefficacy of government programs that tend towards ever-growing spending and are susceptible to blind spots (Wilson, 2014; Griffin, 2015). Aspirations for a new political economic paradigm, evidenced by the increasing incidents of civil disobedience and the growth of populist movements, reveal an emerging consciousness that challenges the typical portrait of modernity.

1.2 Purpose of the Study

The discourse of Green Growth arose from the disenchantment with market and material expansion that had not been able to sufficiently address the problems of modernity. After the financial crisis in 2007-2008, Green Growth became a buzzword in international talks and economic dialogues. Green Growth made a meteoric rise as an alternative paradigm that sought to tackle the dismal economic prospects and persistent environmental degradation represented by the apocalyptic nature of global climate change. It is rooted in the sustainable development discourse but has been shaped into an independent model that is believed to have more practical power than

sustainable development. According to the proponents and architects of Green Growth, sustainable development has lingered in the realm of the norm and has merely created greater burdens and responsibilities on countries, whereas Green Growth is a vision in which actions for environmental protection generate economic opportunities and rewards (Bowen & Frankhauser, 2011). International organizations, specifically the OECD and the UN, emphasized a model of Green Growth, or Green Economy, for a diversity of purposes. Also, many countries joined a new development initiative after the financial crisis and called their strategy the Green New Deal.

South Korea is an exemplary case of a country that aggressively adopted the Green Growth initiative into its national development strategy. Former President Lee Myung-Bak declared the Green Growth Initiative a new paradigm for South Korean development in a 2008 congratulatory speech for the 60th anniversary of the nation's founding. Shortly after, a new model of governance designed to help push the new initiative forward was introduced under the strong leadership of the Presidential Office. The organization that designed the Green Growth initiative, the Presidential Committee on Green Growth, was composed of government officers of various ranks who represented all the country's economic ministries, and also contained selected civilian experts and representatives from diverse interest groups and civil organizations. The Presidential Committee on Green Growth targeted the cooperation of the central and local governments of Korea, and installed local Green Growth committees under the control of seven metropolitan cities' mayors and nine provinces' governors. Figure 1.1 visualizes the governance system of the KGGI.

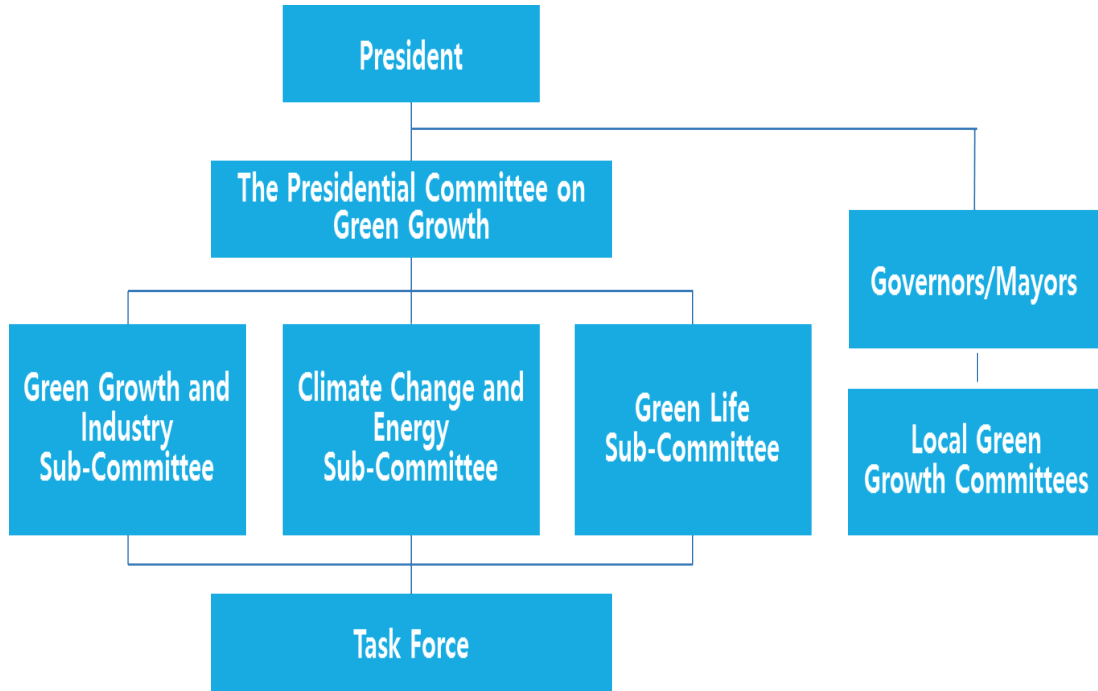


Figure 1.1: Governance system of the KGGI

The unveiling of the Korean Green Growth Initiative (hereafter referred to as the KGGI) established a government Green Growth investment requirement of more than 2% of GDP per year, a 30% greenhouse gas (GHG) emission reduction target from the business-as-usual scenario (BAU) by 2020, and the building of a Green Growth legislative framework, among many other goals. For five years of the President Lee’s administration, the KGGI was the policy initiative that steered each ministry’s policy direction. “Green” was attached to the name of almost all newly introduced programs and government officers affirmed that if new programs contained the word green in their name, they were more likely to obtain government funding (Interviewee 9; Interviewee 18).

The first wave of the KGGI (KGGI 1.0) concluded with the end of the Lee administration and is now actively being evaluated by diverse entities from various perspectives. To date, these evaluations are not favorable. In spite of being rooted in the sustainability concept, the political intention embedded in the KGGI detracts from its authenticity as a new development strategy. However, this has to be seriously examined because the initiative is founded on the controversial belief that the economy and environment are commensurable. The KGGI represents a very unusual and experimental program for a country like South Korea, which has historically sought material expansion at the expense of other values. Korea is one of the few countries outside the West to build its economy on the occidental economic path and then introduce an alternative belief to the occidental conventional wisdom.

In order to escape the agony and dire poverty that Koreans faced after the Civil War (1950-1953), the South Korean government and people placed affluence at the top of social values. As a result, this material value overwhelmed all other spiritual, ecological, and equity-based values, and South Korea followed the occidental economic development path without question. South Korea's meteoric rise from one of the world's poorest countries to an OECD member country within 50 years is dramatic and unprecedented. However, South Korea accomplished this economic feat mainly through oil refining, industrial chemical production, automobile manufacturing, and steel production, which all emit high levels of CO₂. As a new member of the group of developed nations, it is a large challenge for Korea to abruptly introduce an initiative that requires holistic change in its economic, social, and environmental policies and industrial structure.

Further, it is significant that South Korea, as only a middle power, has led the international talks, research, and policy initiatives related to Green Growth. It is not an exaggeration to say that Korea is the only country that has promoted the Green Growth initiative as a national development strategy in such an expedited fashion. This was possible because South Korea has had a long history of central government-led economic and social development. Many challenges have been encountered throughout the design and implementation of the KGGI that reflect power struggles among different entities and conflicts between the old and new ways of conceiving the relationship between the economy and environment. Regardless of what fruit the KGGI may finally bear, it is still interesting for a number of reasons to thoroughly examine the details of the KGGI, not the least being that it was a battlefield where the candidate paradigm challenged an old and powerful goliath: the conventional wisdom of economic development.

Green Growth is an interesting challenge that tests the possibility of harmonizing economic growth and environmental protection. Given that economic growth is typically considered an unquestioned goal in national management, the concept of Green Growth as environmental protection under guaranteed economic growth seems attractive. The problem is whether the concept of the Green Growth is valid. Green Growth has been promoted as a new paradigm that allows humanity to transcend the impasse of stagnant international talks and construct a new form of governance based on tackling climate change and promoting Sustainable Development. Recently, the excitement surrounding Green Growth as a new paradigm candidate—in the international community as well as in South Korea domestically—has cooled alongside the collapse of international climate governance under the Kyoto

Protocol. Therefore it is imperative that we now examine whether Green Growth represents a new paradigm that effectively addresses modernity's failures or merely repackages the ideals of the dominant paradigm in new words. Regardless of whether a new climate governance system puts pressure on individual countries to reduce emissions, the apocalyptic propensity of environmental degradation remains the reality of humanity and our planet Earth. Whether or not Green Growth represents an authentic paradigm shift in the modern political economy, it is clear that humanity needs a new paradigm. Investigating the critical case of the KGGI can therefore help us learn from one attempt at a paradigm shift and apply these lessons for the future. This research seeks to test whether Green Growth qualifies as a new paradigm capable of replacing the prevailing "Progress Paradigm" (PP) that is founded upon the modern ideals of efficiency, economic growth, and technological progress. This study proceeds by first elucidating five core features of the Progress Paradigm that are meant to achieve these ideals, then testing whether the KGGI's actual programs differ from or mirror these core attributes. The factors that led to the KGGI being a successful or failed paradigm shift are then analyzed and the implications of a successful paradigm change are proposed in the study's conclusion.

1.3 Research Questions

This study tests the claim that Green Growth represents a break from the Progress Paradigm that has shaped the modern political economy, and thus can provide relevant solutions to the modern anomalies the PP has enabled, which include ecological destruction, growing socio-economic inequality, and the loss of autonomy in the governing of humanity's political and private life.

To answer this general question, this study first needs to establish specific questions. As already described in the previous section 1.2, it is essential that the study first identify the core characteristics of the Progress Paradigm to provide benchmarks for verifying whether Green Growth offers something new and distinct from the type of thinking that is currently in place. This part of the inquiry is guided by the question: “What are the core characteristics of the Progress Paradigm?” The analysis, which identifies the intellectual origin of each characteristic of the Progress Paradigm and resulting socio-economic form each has taken, lays the groundwork for the research and comprises the initial portion of the study. This work raises an additional question: “What socio-economic crises have emerged through the intensification of each PP characteristic?” Crises threatening the validity of the Progress Paradigm are then described in detail. The analysis of the Progress Paradigm concludes by asking the question, “Can the prospective alternative paradigm of Green Growth solve the crises that the Progress Paradigm has created?” This question has its origins in the Green Growth discourse that arose from the realization that remedies for modern problems cannot be found within the Progress Paradigm.

The latter part of the study analyzes the detailed action programs of Green Growth. While the former part of the study mainly focuses on the general ideals and perspectives of the Progress Paradigm and Green Growth, the level of analysis in this section shifts towards examining the detailed practices of the prospective paradigm. Although the history of Green Growth is too short to allow us to analyze the socio-economic phenomena it engendered, we are nonetheless able to anticipate the outputs that Green Growth will create by uncovering the embedded values, main beneficiaries, and governance system of its decision-making bodies. To this end, I ask five questions

that follow from a common theme: “Are certain Green Growth programs capable of solving problems that the core characteristics of the Progress Paradigm have generated?” For instance, the first question asks: “Can programs implemented under the KGGI improve the quality of life for citizens and promote other values aside from economic growth?” The five questions asked in this section parallel the five core characteristics of the Progress Paradigm identified earlier in the study. Although these analyses focus on dissecting the theory of Green Growth, they take place at the policy level because the effectiveness of a theory can be determined by how it is applied in practice. In this way, the KGGI, which is one of the most critical exemplars of Green Growth, is a case that testifies to the worth of the paradigm. If it is shown that the nature of the programs implemented under the KGGI still adhere to the core values and replicate the same power structure as the PP, then Green Growth can hardly be considered a shift away from business-as-usual.

The additional question of interest is whether Green Growth may have the potential to initiate a significant change in the theory guiding the field. This question raises a second question of whether pursuing incremental changes could be a more effective and an easier means of fostering change than attempting to bring about holistic change through a paradigm shift.

Chapters 7 to 11 offer an answer as to whether the KGGI achieved a policy shift, and the concluding chapter will discuss whether incremental changes at the policy level can address the root cause of current anomalies left unsolved by the Progress Paradigm.

“Is Green Growth a paradigm shift?”

- What are the core characteristics of the Progress Paradigm?
- What are the socio-economic crises that each characteristic of the Progress Paradigm has brought forth or intensified?
- Does the prospective paradigm of Green Growth present an alternative capable of solving the crises that the Progress Paradigm has produced?
- Are certain Green Growth programs capable of solving problems that the core characteristics of the Progress Paradigm have generated?
- (Five additional sub-questions are asked that correspond to each of the core characteristics of the Progress Paradigm.)
- Is Green Growth a policy shift?

Figure 1.2: Research Questions.

1.4 Methodology

The inquiry conducted in this study is comprised of two parts. The first part consists of a theoretical analysis of the Progress Paradigm that is based on Thomas Kuhn’s paradigm theory. Characterization is also used to outline the form of the Progress Paradigm and its crisis as well as the counter-paradigm of Green Growth. The concept of paradigm is explained in detail in chapter 2, which serves as the theoretical framework of this study. Chapters 4 and 6 characterize the PP and its crises

and GG, respectively. The second part of the study contains a policy analysis of the Korean case using the method of narratology.

1.4.1 Narratology: The Narrative of South Korean Case

A Wittgensteinian approach is applied to narrate the case of Green Growth in South Korea. Flyvbjerg used this approach in his detailed case study on modernity and democracy in a Danish town (Flyvbjerg 1998). In the study, Flyvbjerg told the story of the Aalborg¹ Project² in Denmark by contrasting the formal rules and implicit principles of democracy in the city government with how the government actually functioned in terms of its politics, administration, and planning. He investigated the government and interest group decision-making and noted the interactions and political compromises that took place between them. Through Flyvbjerg's narrative of actual events, the reader was led to real scenes rather than to summaries, concepts, or general norms. In this way, Flyvbjerg vividly demonstrated how modern governments could impinge upon democracy, despite the presence of strong democratic ideals, and also how some modern process of resolving power conflicts can diminish democratic principles.

I apply Flyvbjerg's method to an in-depth case study of the KGGI to investigate the true rationalities behind the everyday politics, planning, and

¹ Aalborg is a Danish town and a typical medium-sized European city. It is the main urban administrative and commercial center for northern Jutland, a region that is home to a half million people (Flyvbjerg, 2001, p. 3).

² The Aalborg project, an award-winning scheme that was recommended by OECD as a model for international adaptation on how to integrate environmental and social concerns into city politics and planning, discussed how to deal with the car in the city (Flyvbjerg, 2001, p. 4).

implementation of Green Growth. Like Flyvbjerg, I intend to tell the real story of the Korean Green Growth Initiative—not a summary or generalization of it. I show what is happening in a real place and specific context beyond the officially sanctioned ideals, plans, and codes of Green Growth. The ideals and reality of Green Growth are at the center of this story. The goal is to uncover the diverse, complex, and conflicting dimensions and power relations that have played a role in shaping what Korean Green Growth actually came to be.

The emergence of Green Growth is important because it signals an effort to revive humanity's autonomy and stop the anthropogenic destruction of nature. It raises questions about theorems that modernity has established, such as the belief in economic growth, institutional democracy, and the duality of nature and humanity.

With the development of industrialization and modernization, human societies became bigger and more complex. In addition, the increasing mobility of people made social solidarity difficult under a specific cultural consensus. In this condition, 'the system'—which Habermas defines as the state and the economy, which are steered by power and money respectively—takes over the function of social integration, thereby abandoning the Husserlian 'lifeworld' of the informal social life of family, household, culture, voluntary organizations, etc. The lifeworld provides shared meanings and understanding to the members of society and becomes the base of social life and communicative actions. As Habermas and McCarthy states:

By the everyday lifeworld is to be understood that province of reality which the wide-awake and normal adult simply takes for granted in the attitude of common sense. By this taken-for-grantedness, we designate everything which we experience as unquestionable; every state of affairs is for us unproblematic until further notice (1985, p. 130).

The problem is that ‘the system’ is inherently opaque. According to Habermas, systems reinforce the patterns of actions in which agents conceal their aims and do not manifest the ends of actions (Finlayson, 2005). Thus, the members of society do not often realize the full meaning of economic and administrative actions. Habermas explains the phenomenon through the concept of the *colonization of the lifeworld*. It proceeds as a series of processes as follows: the steering media of money and power become uncoupled from the lifeworld; the capitalist economy and administrative system become gradually detached from the spheres of family and culture, and the institutions of the modern public sphere such as the mass media and political parties exclude people from the decision-making that affects their lifeworld. As a result, people become locked in the individual private realm. They remain an “administered public” and consume culture as a commodity. Marx (2007) used the similar concept of alienation to describe this situation about 100 years before Habermas.

The colonization of the lifeworld results in the loss of human autonomy in controlling its own social life and causes social malfunction. Without the ability to notice the systemic origins of social malfunctions, society loses power to the vested interests that continue the process of elevating power and money above social concerns. As such, the social structure and norms that were built by the system are reinforced. In this context, we arrive at the fundamental question of whether societies really function according to the true well-being of humanity, which ought to be their ultimate aim. More specifically, we might ask the question: Does the effort to change a paradigm addressing the social, economic, and environmental malfunctions promote human well-being and autonomy within the lifeworld, or does it reinforce the logic of money and power?

Presently, we can reach an assumption that the tragic events which humanity is facing—i.e. anthropogenic climate change and mounting ecological catastrophes that threaten the existence of humanity and other beings—has been an outcome of the modern systemic attempt at dominating the lifeworld through the state and economy. The capitalist economy engendered the present society-nature regime that is founded on the modern premise that human progress hinges upon the mastery of nature. In this regime, it is thought that nature presents an unlimited supply of resources for serving humanity's purpose and that society can 'know' nature and apply its knowledge to manipulate and shape it for its sake (Byrne, Glover, & Martinez, 2002). In this vein, an environmental crisis cannot be tackled without first addressing the dualism that underlies the modern view of nature and society. Understanding the philosophy of the modern political economy, in which the system overrides the lifeworld, is a requirement for understanding contemporary environmental issues.

Since we now live in the colonized lifeworld, we must penetrate government and interest group decision-making and the interactions and political compromises between them to observe the reality of our life. Only when we comprehend the reality of the system's intention can people push the system towards a certain set of actions and recover a true democracy in which the lifeworld functions well and controls the system, rather than the other way around. To sum up, the narratology approach used in this study represents a very small step towards attempting to restore human autonomy in economic life.

1.4.2 Research Techniques

1.4.2.1 Review of Documents

Relevant documents will be reviewed extensively. The documents produced by the South Korean government are the foundational sources I used to comprehend the Korean Green Growth initiative (KGGI). The South Korean documents include the official publications by diverse Green Growth related government agencies, government memoranda, policy announcement papers related to Green Growth across government departments, and policy analysis papers produced by national research institutes.

Reports from newspapers and magazines are important sources since the government's actions are delivered by mass media to the public. Mass media also play an important role as a venue to reflect upon civil society's reaction to the policy initiatives of the government.

Business is a key player in the KGGI. Green Growth requires significant changes in the practices of the business sector because it must include a strong structural transformation from traditional brown industries (i.e., environmentally unsustainable industries) to new green industries (i.e., environmentally sustainably industries). The extent of the acceptance or challenge with which businesses respond to government actions can significantly alter the implementation of Green Growth. In practice, South Korean businesses utilized diverse strategies to make the KGGI operate according to their interests. In this sense, business proposals against action programs of the KGGI provide good sources help to grasp the challenges posed by the business sector.

I also utilize reports by civil society and memoirs and books of key individuals associated with the KGGI to draw out meaningful insights. Along with these South Korean documents, I draw on reports from international economic organizations that are actively engaging in the spread of Green Growth, such as the OECD, World Bank, and UN agencies. These reports help to illustrate the contrast between the ideals of Green Growth and the reality of its implementation. Both the ideals articulated in the documents and how they were administered in reality will be examined.

1.4.2.2 In-Depth Interviews with Core Promoters of the KGGI

In this study, results from in-depth interviews with core promoters of the KGGI become important sources for examining the reality of Green Growth. The interview is a critical vehicle to reveal the true colors of the KGGI by teasing out the inherent values of the KGGI, its processing of power conflicts, and its means of resolving disputes, which form the actual practices that lies behind the government's official propaganda; e.g., the official announcements and materials published by the government. For this reason, interviews were not structured around a formalized questionnaire. Rather, the questioning was flexible and changed according to interviewee's background, responsibility, and level of involvement in the KGGI. Even though a questionnaire was set for a specific interviewee, conversations freely flowed and extended to diverse topics or deeper questions according to interviewee's answers, experience, and insight, which were not expected beforehand. The basic questionnaire commonly included questions similar to the following: Is a value change really happening in the KGGI? Who are the winners and losers of this initiative? How has its logic developed? Who has played a strong role?

Interviewees were mainly government officials who were directly involved in the design and implementation of the KGGI. Professionals and scholars who joined the Presidential Committee on Green Growth were also included in the interviewee group. The interviews are further utilized to contrast the ideals present in the study's review of official documents with the underlying practices of the initiative. Interviews were mainly conducted from July 28, 2014 to August 8, 2014. As the dissertation developed, further interviews were conducted to flesh out the discussion. As a result, there were a total of 20 the KGGI-related persons interviewed. Interviewees were recommended by a committee, which was created to minimize researcher bias and ensure that the chosen interviewees were representative of the diverse actors associated with the KGGI. The committee included three professionals related to the KGGI and included a high level government official who was deeply involved in the KGGI, a senior researcher of a national research institute of Korea that was mainly in charge of developing Green Growth policy, and a senior professor who participated in the Presidential Committee on Green Growth, had studied sustainable development for his entire career, and possessed an extensive network of contacts in related businesses and civil society.

Of the 20 interviewees, eleven persons were high-level government officials who were deeply involved in the KGGI during the Lee Myung-Bak administration from 2008 to 2012. Two of them were the Secretaries to the President who faithfully executed the will of President Lee. Seven of them were career bureaucrats who were transferred to the Presidential Committee on Green Growth from mostly economic affairs ministries and assigned to the Task Force depicted in Figure 1.3. These interviewees were deeply involved the development of Green Growth agenda and led

Green Growth policies. The final two were key architects of the energy policies of the Lee Administration who played a critical role in creating energy policies for the KGGI.

Three interviewees were with professionals in the climate change and energy fields who work for the South Korean national research institutes. These individuals have been deeply engaged in developing the nation's core climate adaptation policies and designing the country's energy future. Some of them directly joined the Presidential Committee on Green Growth and supported the Task Force of the Committee by providing profession knowledge, related data, and ideas for new policies.

Two interviewees represented the business sector. These people were in charge of green issues at South Korean business associations including the Korea Chamber of Commerce and Industry and the Federation of Korean Industries. These two associations become the representative center of businesses opinions regarding industrial policies and diverse socio-economic issues. These two business sector interviewees were deeply involved in helping shift the government's Green Growth policies toward the interests of businesses. They understand how the business sector perceives Green Growth policies and possess insider information concerning how businesses reacted in the critical moments during the formation of Green Growth policies.

Four persons were from academia. Two of them have actively played roles as advisors in diverse government committees and are celebrated scholars in the climate change and energy fields and were members of the Green Growth Committee depicted in Figure 1.3. The other two were comparatively junior scholars who studied green

economy and urban planning and also joined the government’s policy formulating process.

To protect the privacy of interviewees, they are named numerically from Interviewee 1 to Interviewee 20. Table 1.1 shows the affiliations and education background of Interviewees. These interviews become the background knowledge I used to understand the practice of the KGGI. Statements of some interviewees are cited in the dissertation to enliven and enrich the discussion.

Table 1.1: Interviewees

Interviewees	Affiliations and Education Background
<p style="text-align: center;">9 Interviewees (The Presidential Committee on Green Growth/ Government Officials)</p>	Interviewee 1: Presidential Office, International Relations (Masters Degree from Korea)
	Interviewee 2: Ministry of Strategy and Finance, Business (Masters Degree from the US)
	Interviewee 3: Ministry of Strategy and Finance, Business (PhD from the US)
	Interviewee 4: Presidential Office, International Relations (Masters Degree from the US)
	Interviewee 5: Prime Minister’s Office, Law (PhD from Korea)
	Interviewee 6: Ministry of Knowledge Economy (Present Ministry of Trade Industry and Energy), Economics (PhD from the US)
	Interviewee 7: Ministry of Environment, Public administration (Bachelors from Korea)
	Interviewee 8: Ministry of Environment, Engineering (PhD from the US)
	Interviewee 9: Ministry of Strategy and Finance, Economics (Masters Degree from the US)

2 Interviewees (Government Officials)	Interviewee 10: Ministry of Knowledge Economy (Present Ministry of Trade Industry and Energy), Economics (Masters Degree from the US)
	Interviewee 11: Ministry of Knowledge Economy (Present Ministry of Trade Industry and Energy), Policy (Masters Degree from the US)
3 Interviewees (Researchers at National Research Institutes)	Interviewee 12: A national research institute, Economics (PhD from the US)
	Interviewee 13: A national research institute, Business (PhD from Korea)
	Interviewee 14: A national research institute, Economics (PhD from the US)
2 Interviewees (Industries)	Interviewee 15: The Korean Chamber of Commerce, Engineering (PhD from the US)
	Interviewee 16: Industry and the Federation of Korean Industries, Engineering (PhD from Korea)
4 Interviewees (Scholars)	Interviewee 17: Environmental Planning (PhD from Korea)
	Interviewee 18: Resource Economics (PhD from the US)
	Interviewee 19: Urban Planning (PhD from the UK)
	Interviewee 20: Politics (PhD from the US)

1.5 Organization of Chapters

Chapter One provides an overview of the study. It includes a statement of the study's expected contribution to the present discourses associated with the environment-economy-society relation paradigm, describes the research design of this dissertation, proposes research questions, and introduces the methodology.

Chapter Two examines aspects of paradigm theory as a vehicle to analyze new concepts of social phenomena. First, Kuhn's original theory of paradigm changes

in the natural sciences is explained. Thereafter, I demonstrate how Kuhn's paradigm theory applies to social phenomena by offering a definition of paradigm in the social sciences with reference to other scholarship on the topic. Also, criteria to demarcate the old economic paradigm from a new one will be suggested. Finally, I will connect Kuhn's concept with this study's intellectual tradition.

Chapter Three describes the thought of diverse schools concerning the modern dilemma. Four schools are introduced in this chapter. Market liberals seek solutions in the realm of the current paradigm. They believe that the market is the most efficient system to develop and apply solutions to problems that the market economy has created. The other three schools—institutionalists, bioenvironmentalists, and social greens—share the idea that the current Progress Paradigm cannot fix modernity's failures. Institutionalists believe that institutional intervention and international governance combined with economic growth and globalization are best capable of solving modern crises. But while institutionalists doubt that solutions to modern crises can be found by solely relying on the power of the market alone, they, like market liberals, are confident that solutions can be found within the existing political economic system. In this way, institutionalists and market liberals are closer ideologically than market liberals are with either bioenvironmentalists or social greens, both of which argue that significant changes must be made to the current political economy. Bioenvironmentalists pay attention to the bio-capacity of the global ecosystem and argue that the modern exploitation of the environment has already overstepped the planet's capacity to support human societies. They propose that the developed world shift their growth-oriented mode of economic development to a steady-state economy and advocate that population growth should be controlled in

developing countries. Like bioenvironmentalists, social greens are also skeptical about economic growth and globalization; however, social greens focus on the socio-economic troubles in the Global South that have their origins in globalization. Moreover, social greens have an interest in political ecology, which concerns the society-economy-ecology nexus. Social greens believe that the solution to modern crises resides in recovering community autonomy and re-establishing common pool resource regimes. They also stress that decentralized local economies are preferable to a single globalized economy.

Chapter Four illustrates the multifaceted nature of the Progress Paradigm. Through this process, five key features are enumerated: the belief that economic growth is progress per se; the confidence in technological change; the efficacy of a coalition of the government and market; the belief in humanity's mastery over nature; and the embrace of governance by experts and bureaucrats. Each characteristic serves as the reference against which the conformity of Green Growth to the Progress Paradigm is examined. In addition, this chapter also illustrates the modern crises that the Progress Paradigm failed to solve and thus provoked demands for a new paradigm. Each characteristic of the Progress Paradigm and the associated crisis generated from it are used to construct research questions that are applied to the paradigm verification at the policy level that takes place in chapters 7 to 11.

Chapter Five explores the modern abundant energy system. The abundant energy system of modern society is a representative example of how the five key features of Progress Paradigm interrelate. The discussion is organized around five perspectives that mirror the five features of the PP, which are reflected in how the modern energy system operates. The chapter discusses the embodiment of the “more is

better” ideology in the energy system, the complex energy system, how scientific nature is founded on scientific energy, how the abundant energy system is supported by state-market coalition, and how modernity engendered undemocratic socio-economic features in the energy system.

Chapter Six deals with the diverse aspects of Green Growth that are meant to serve as a possible paradigm challenger for addressing the issues present in the modern paradigm of economic development. This chapter consists of three parts: the background of the Green Growth paradigm’s emergence; the definition of Green Growth and its essential dimensions; and the core feature of the KGGI.

Chapters Seven through Eleven discuss the Korean case study in order to reveal how Green Growth has been realized and identify whether it constitutes a new paradigm or conforms to the Progress Paradigm. In these chapters, the study focuses on analyzing whether the KGGI reproduces the core characteristics of the Progress Paradigm that are identified in chapter 4. Core policy programs of the KGGI are explored to determine the extent of the KGGI’s (dis)conformity to the Progress Paradigm. First, how the KGGI has sought to improve citizens’ quality of life, a major Green Growth objective, is examined to verify whether Green Growth breaks from the core belief of the Progress Paradigm that “economic growth is progress *per se*”. Second, green technology R&D is decoded to determine if Green Growth places its faith in Promethean technology like the Progress Paradigm. Third, the institutionalization process of the Korean emission trading system is investigated to see if a meaningful change has occurred in the coalition of state and businesses, which has played a major role to engender the prevalent power structure of the Progress Paradigm. Fourth, the 4 Rivers Restoration Project is unpacked to reveal whether the

Progress Paradigm's focus on establishing human domination over nature has been overturned. Fifth, the governance system of the KGGI is scrutinized to clarify if Green Growth continues to reinforce the governance system of the Progress Paradigm in which decision-making has been monopolized by experts and bureaucrats. Lastly, the energy system of the KGGI is analyzed to determine whether the energy system of Green Growth replicates that of the Progress Paradigm.

Chapter Twelve serves as the conclusion of this study. It offers a general finding of whether Green Growth should be considered a paradigm shift and summarizes the policy findings of the study. It is not the aim of this chapter to present a generalized new political economy paradigm to be implemented. Instead, the concluding discussion of this dissertation will focus on describing how a polycentric approach may offer one way towards creating a paradigm shift regarding the prevailing society-environment-economy nexus.

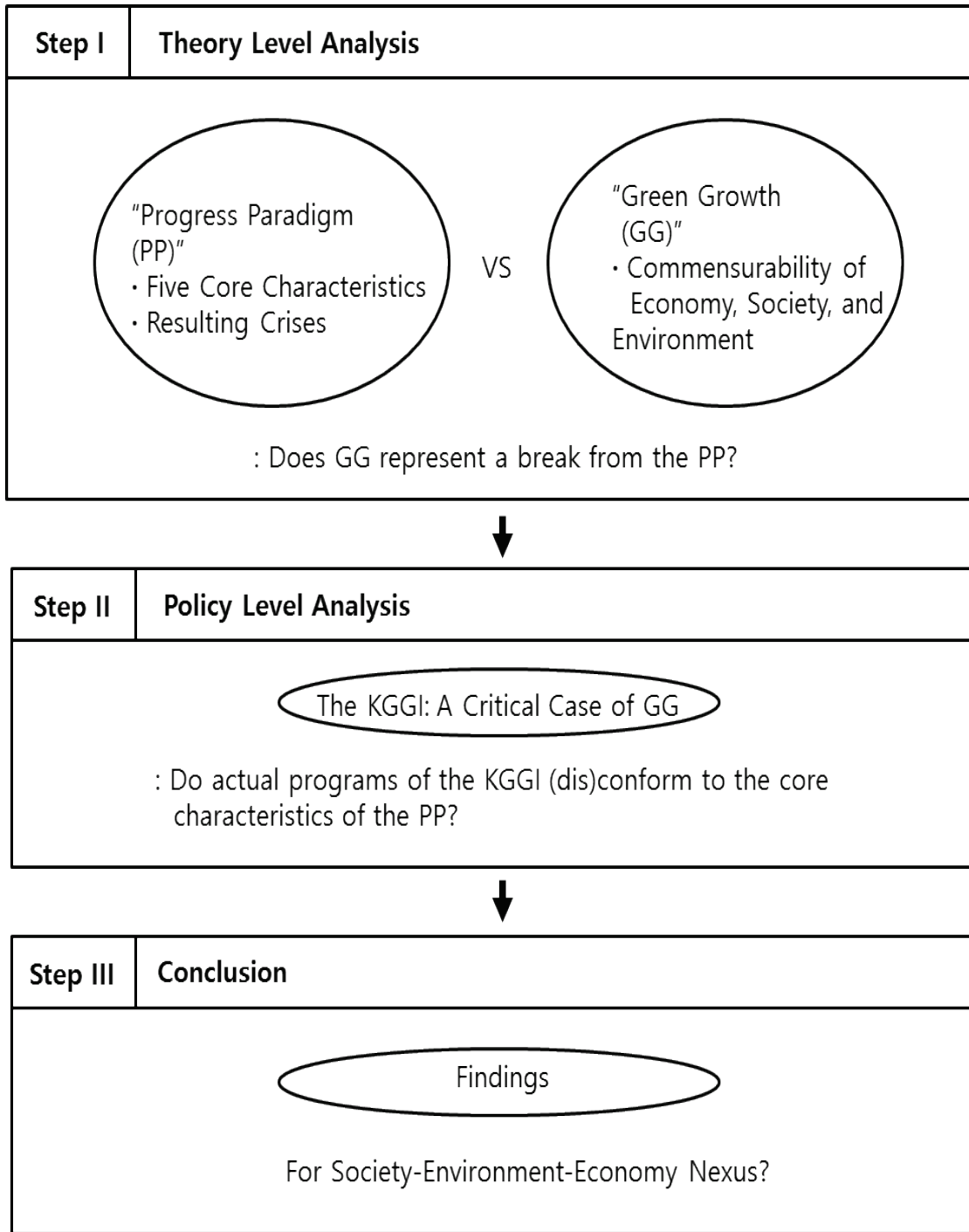


Figure 1.3: Flowchart of the Research.

Chapter 2

THEORETICAL FRAMEWORK

This chapter examines paradigm theory as a means to identify a political economy that contextualizes contemporary successes and failures and creates prescriptions for solutions to crises. There are many competing proposals for new economic paradigms. Among many others, GG is one which claims to be a candidate to change the prevailing PP.

Paradigm theory is widely regarded as the work of Thomas Kuhn (1996). He defined paradigm as “an organizing principle which can govern perception” (1996, p. 113). In other words, a new paradigm has to function as an organizing principle for how we perceive our problems and what we perceive as the appropriate ways to analyze problems that the contemporary generation is facing. Humanity is confronting anomalies that extend beyond the mundane activities of everyday life and reach to the broadest conception of intellectual and social life. These crises are not confined to the economic realm. Rather, they extend to all realms of humanity’s life: economy, environment, and society. Therefore, a new organizing principle must not be limited to prescriptions for economic growth. In this context, GG appears to be a new paradigm since it targets all related contingent crises (see the UNEP’s definition on GG in chapter 6). However, GG may not meet the necessary conditions of a new paradigm if it conforms to the core values of the prevailing economic paradigm in critical aspects, such as continuing the old economic ideology and structure.

The severity and urgency of these crises requires a revolutionary change in society's paradigm. The concept of a social paradigm has been interpreted variously as society's organizing principle (Kuhn, 1962), tradition (Hollinger, 1973), example (Friedrichs, 1970), and mental organizing principle (McDonagh, 1976) through which anomalies are perceived and solutions sought.

It appears that the contemporary generation is noticing that the prevailing PP is causing critical crises that are incapable of being solved by business-as-usual methods. Indeed, the contemporary generation is undergoing a paradigmatic transition that follows Kuhn's paradigm theory, as expounded below. It is demonstrated by diverse efforts across academic, institutional, and civilian levels to find a new concept to examine the contemporary experiences. In this study, GG is put in the framework of a paradigm since it presumes the comprehensive and structural change of the economy. As OECD noted in its policy report *Towards Green Growth*:

We have to find new ways of producing and consuming things. And even redefine what we mean by progress and how we measure it. And we have to make sure to take our citizens with us on this journey, in particular to prepare the people with the right skills to reap the employment benefits from the structural change (2011b, p. 3).

The concept of the paradigm is used in this chapter to describe how worldviews develop and change over time. First, Kuhn's original consideration of paradigm in the natural sciences will be explained. Next, it is demonstrated how Kuhn's paradigm theory applies to social phenomena by offering a definition of paradigm in the social sciences with reference to scholarship by Friedrichs, McDonagh, Hollinger, and Dolfsma and Welch. Criteria are suggested for differentiating between the prevailing PP of the modern political economy and that of

an alternative, such as GG. Finally, Kuhn's concept is connected with the intellectual tradition.

2.1 Thomas Kuhn's Paradigm Theory³

2.1.1 Kuhn's Concept of Paradigm

Traditionally, scientific development has been considered "the process of piecemeal accumulation" (Kuhn, 1996, p. 1). This means that scientific development is a linear and episodic process. New scientific generations continue to stack new bricks of knowledge on the wall of accumulated knowledge that preceding generations constructed. This perception highlights the progressive and evolutionary nature of scientific development. In this view, there exists an unchangeable universe and scientific development is a cooperative work between scientific generations to arrive at authoritative scientific knowledge about that universe.

However, Kuhn does not agree with this conventional wisdom. Rather, he stresses the revolutionary nature of scientific development. A revolution is a historical event that includes the overthrow of an existing order and the establishment of a new order. It negates existing notions, institutions, and perspectives. It is accompanied by a constitutional transformation in every aspect of an academic society. After the French Revolution, when the monarchy was replaced by a republic, people came to live in a completely different political and ideological world. For Kuhn, a scientific revolution means building a new system of thinking akin to a political revolution. In this sense,

³ The content of this section draws heavily from the class "Processes of Social Inquiry" offered by Dr. John Byrne in the spring 2011 semester in the School of Public Policy and Administration at the University of Delaware.

there is no perpetual scientific assumption. Even though a theoretical authority is firmly placed in a scientific community, it can lose its dominant status when peoples' minds move on to a new alternative. The paradigm shift theory takes the possibility of alternatives for granted. Kuhn refers to this change of paradigms as a scientific revolution. As he notes: "The successive transition from one paradigm to another via revolution is the usual developmental pattern of mature science" (1996, p. 12). When the existing paradigm is replaced by a new paradigm, a scientific revolution is realized.

Kuhn uses the concept of "paradigm" to demarcate the comprehensive discipline of a scientific community. A paradigm can be compared to a political constitution. The constitution is a set of common values among a people. It becomes the behavioral, moral, and political norm of a society. As laws and governance of public and private organizations are formulated within the spirit of the constitution, a scientific community conducts its research in the discipline within the paradigm. Kuhn's paradigm is the constitution of a scientific community that circumscribes the boundary of research and integrates scientists into its academic discipline. Within a specific paradigm, the studies of scientists aim to demonstrate the explanatory power and reinforce the precision of a paradigm. In other words, a paradigm is a world-view, i.e. a belief system, by which a scientific community looks at problems, interprets situations, and generates solutions. If the paradigm that members of the community share changes, it brings about the replacement of the society's world-view. As Kuhn notes:

Paradigm changes do cause scientists to see the world of their research-engagement differently ... after a revolution scientists are responding to a different world ... what chemists took from Dalton was not new

experimental laws but a new way of practicing chemistry (he himself called it the new system of chemical philosophy) (1996, p. 111, 134).

2.1.2 Kuhn's Four Stages of Scientific Paradigm Development

The development of science, Kuhn illustrates, follows the process of paradigm shifts through four stages: “pre-paradigm,” “normal science,” “crisis,” and “scientific revolution.” The history of science is the reiterated process of those stages. “Pre-paradigm” is a stage before science. In this stage, a shared paradigm does not exist among scientists yet. However, it is not true that there is no paradigm. Rather, as many paradigms exist as there are scientists. As Kuhn illustrates:

In the early stages of the development of any science different men confronting the same range of phenomena, but not usually all the same particular phenomena, describe and interpret them in different ways (1996, p. 17).

Those paradigms compete with each other. Some of them seem to occupy prevailing status. However, a dominant power has not yet emerged. This is a period of deep debate over legitimate methods, problem definition, and solutions to the crises. Kuhn refers to this stage as “immature-science”.

When one of the pre-paradigmatic schools triumphs over other schools, such initial divergences largely disappear (Kuhn, 1996). The emergence of universally recognized scientific achievement leads a scientific community to the stage of “normal science” at which most scientists share the same world-view. At this stage, scientists conduct their research under the discipline of a specific paradigm. The universally recognized scientific achievement serves as an example for further studies. A scientific community consolidated by a common set of assumptions, beliefs, and knowledge develops a research agenda which supports, preserves, defines, and modifies the existing set of beliefs. Kuhn likens this stage of science to fitting pieces

of a jigsaw puzzle together as scientists refine their discipline. This stage, like a jigsaw puzzle, assumes a specific outcome, namely an objective truth. A paradigm guides a sort of “knowledge game” by generating pieces of knowledge and fitting them together into the framework assumed by the paradigm. The duration of the game depends on the explanatory power of the paradigm. The closer a fit between fact and theory is, the stronger and more durable the influence of the paradigm becomes.

The maturity of science proceeds in this stage. The research of this stage consists in the determination of significant facts, matching the facts with theory, and the articulation of theory. Kuhn explains this stage:

They (scientists) were working both with fact and with theory, and their work produced not simply new information but a more precise paradigm, obtained by the elimination of ambiguities that the original from which they worked had retained (1996, p. 34).

During the period of normal science, the scientists’ community is dogmatized and disciplined. Ironically, this period also accumulates force for a great shift. The more the scientific community tries to reinforce the conformity of its paradigm, the more anomalies are revealed. As the precision of science increases, new phenomena that have never been revealed emerge. As Kuhn points out:

The more precise and far-reaching that paradigm is the more sensitive an indicator it provides of anomaly and hence of an occasion of paradigm change (1996, p. 65).

As more people begin to work on an explanation of the anomalies, a new community emerges, which is no longer bound by the paradigm. However, the strictly disciplined paradigm at the stage of normal science is not tolerant of novel approaches to newly discovered phenomena that cannot be explained by the existing theory. This inflexibility of discipline aggravates the crisis.

When a paradigm loses its validity in explaining new facts, that paradigm encounters a “crisis”. This stage occurs when questions are not solved under the discipline of the existing paradigm or findings do not quite fit to the existing worldview. According to Kuhn, the crisis stage ends in one of three ways. First, anomalies are resolved within the existing paradigm. Second, resolution is deferred and revolutions are often co-opted. Third, revolution succeeds, new theory replaces old and new scientific communities replace old ones. In the last stage of a paradigm shift, scientific revolution is accomplished when new generations who actively accept a new paradigm emerge and they form a large majority of the scientific community.

For the Kuhnian paradigm shift, the transition from one paradigm to another is not a cumulative process. Rather, it is a revolutionary shift accompanied by the collapsing of the existing paradigm that has been articulated and expanded by research within the realm of normal science. The new paradigm creates its own new belief system. Under the discipline of the new paradigm, a scientific community sees the world in a completely different way. A scientific community that has succeeded in a paradigm shift constructs new research fields with new methods and accomplishes a new theoretical generalization. In this stage, the new paradigm is established as a new normal scientific tradition. This normal science that emerges from a scientific revolution is “incommensurable” with that which has gone before (Kuhn, 1996).

Kuhn’s outstanding contribution is to suggest the possibility of looking at the world in different way from the dominant order. Of course, before Kuhn, there had been alternative perspectives to the order. However, Kuhn was revolutionary in that he illustrated the process of the advent of a new worldview and the collapse of the old order in a systematic and sophisticated manner. He clarified that the development of

knowledge depends on a community's collective beliefs, i.e., peoples' belief systems rather than concrete formulas or laws (Popper, 1965). It means the presumption of order cannot be validated until peoples' minds collectively recognize it. Kuhn provided a sound grounding to researchers who believed that an authoritative truth is variable and that ultimate truth is elusive. As Hollinger notes:

The plausibility of Kuhn in the present context depends largely on whether one believes this translation can be effected comfortably, behind the scenes, without turning "problem solving" into another heavy, mechanical formula, and without ignoring aspects of a community's life that we regard as essential to its history... Finally, a positive aspect of Kuhn's sense of development is its emphasis on elements of tradition that are prior to, or even apart from, principles, laws, and other conventionally "rational" organizing devices. Certain specific, concrete achievements within the remembered history of a community may function as models for thinking and acting without first being transformed into abstract principles (1973, p. 378).

Kuhn's conclusions challenged the modernist presumptions inherent to positivism, which had preoccupied the social disciplines. Traditionally, the development of science was believed to be accomplished by the conformity and unity of a scientific community. But Kuhn countered that notion by saying that scientific development is brought about by challenges to authoritative theory and the tolerance of the scientific community to novelty. This is the reason why even though Kuhn's argument was about the development of natural science, it caused a far more intense controversy in the social sciences. As Wolin notes:

The value of Kuhn's book is that it takes direct issue with certain specific notions concerning scientific progress which are a vital part of the justifications accepted by political scientists (1968, p. 131).

Kuhn's theory confronts the assumptions of positivism. Positivism is the philosophy that has underpinned the spirit of modern society with overwhelming

power. It presupposes that there exists absolute, universal, and ultimate truth. The aim of individual academic fields should be to continue to demonstrate the authority of the objective truth with facts and to create solutions and means to reach the ultimate truth most speedily and effectively. In positivism, to be objective is a prerequisite in seeking knowledge. The intervention of the human mind, positivists warn, prevents inquiries and affairs from being objective and therefore distorts rational results. In generating knowledge, to be value-free or neutral becomes the most important quality. Karl Popper sums up the kernel of positivism by stating:

By the doctrine that truth is manifest I mean, you will recall, the optimistic view that truth, if put before us naked, is always recognizable as truth. Thus truth, if it does not reveal itself, has only to be unveiled, or discovered. Once this is done, there is no need for further argument. We have been given eyes to see the truth, and the 'natural light' of reason to see it by (1965, p. 175).

Positivism is the expression of modern man's optimism and pride. In modern society, humanity achieved unprecedented progress in material life. It brought about unimaginable wealth and convenience to humanity. Humanity could be emancipated from perpetual poverty, devastating diseases, and political subjugation that had troubled life. Positivism is embedded in the notion that modern industrialism is the ultimate economic system from which humanity can draw. It also reveals the strong trust of humanity's intellectual intuition to discover the ultimate system for organizing society. It is an irony that infinite confidence in human intellect, bordering on hubris, shut the door on new intellectual discoveries. In the end, the undercurrents of positivism reveal themselves, as the new discipline shields itself from alternatives.

2.2 The Applicability of Paradigm Theory to Social Inquiries

2.2.1 The Core Nature of Paradigm Shift: Substituting a New World-View

Many scholars have rejected the paradigm shift theory's applicability to social sciences. Most skeptics raise questions about the fit of Kuhn's theory to the social studies. Bronfenbrenner examines the history of economics in the context of a revolutionary structure, and he speaks against the paradigmatic shift in economics. In economics, unlike Kuhn's argument, the old paradigm is not entirely displaced in a new discipline. For instance, the Keynesian theory uses parts of the Marshallian supply and demand theory. The development of economics, he argues, follows not a catastrophic, revolutionary process but instead a dialectic process in which a prevailing thesis is modified and incorporates the attributes of its antithesis into the discipline (Bronfenbrenner, 1971).

It is true that the characteristics of social science, namely the complexity of the social sciences and the inextricable involvement of human values, undermine the rigorous application of the paradigmatic approach. However, the key of this dispute should not be the rigid application of any individual stage of paradigm shift theory, but rather it should be the interpretation of fundamental factors. Kuhn does not argue for total invalidation of the old paradigm. Rather, he thinks that diverse knowledge communities play an important role in the new paradigm, but they interpret knowledge in a completely different way from the old paradigm. The kernel of Kuhn's paradigm shift is the replacement of world-view, not of a specific method or apparatus.

2.2.2 The Compatibility of Paradigmatic and Dialectic Change

Ordinarily the two camps that advocate the validity of a dialectic or paradigmatic approach deny each other's assumptions wholesale. However, the

dialectic and paradigmatic theories are not mutually exclusive. Both of them offer views on the mechanisms of change that are thought to help explain the past as well as to forecast the future if these mechanisms continue to follow the same trajectory. In other words, these theories are objective and normative at the same time. Their arguments inevitably imply their own ideology. While the paradigmatic camp focuses more on dismantling the existing order, the dialectic camp favors the stability of the system i.e. the incremental evolution of society rather than fundamental change.

Paradigmatic shifts and dialectic changes take place at the same time. The paradigmatic shifts are a longer term and more comprehensive process. They are extraordinary and revolutionary events. On the other hand, dialectic changes are routine, short term, and micro level processes. Paradigmatic shifts encompass myriad dialectic changes. In accordance with Kuhn's theory, dialectic changes occur in the time of "normal science". This stage is the adaptation of the dominant paradigm to raise its explanatory power. Dialectic change takes place within the fundamental spirit of the dominant paradigm. As long as the changes of sub-theories are effective for puzzle solving, scientists do not have any interest in the governing principle. With dialectic changes, however, the limitations of existing theory in explaining new anomalies are revealed, and some members of a scientific community begin to seek the replacement of the grand framework. According to Sheldon Wolin, paradigm shifts in politics have arisen in response to crises in the political world. Examples are diverse: "Plato's criticism of democracy, Machiavelli's strictures on princes in the *Discorsi*, Locke's indictment of royal absolutism, and Marx's critique of capitalist society" (1968, p. 151). Wolin also reiterates Kuhn's point that a noteworthy attribute of the activities that take place under "normal science" is "how little they aim to

produce major novelties, conceptual or phenomenal” (1996, p. 35). Wolin implies that when the crisis of a theory becomes clear, if an academic community sticks to the dialectic solutions, that community inevitably becomes stagnant and loses the ability to draw alternatives that increases the crisis. From this point onwards, knowledge serves as a safeguard for vested interests. It also acts as an ideology of suppression. The academic society becomes closed, echoing Popper’s (1965) warning of a closed society that results from an academic community’s intolerance to new ideas.

In the same context, overly frequent paradigm shifts hamper the development of knowledge, because society lacks time to adjust to all the changes and developments of knowledge for each subsequent paradigm. Scientists work within a framework. Without the framework, it is the same as if they worked without the aim of research. According to Kuhn, each paradigm will be replaced by a new paradigm eventually. In spite of the renouncement of the old paradigm, the knowledge produced in the old paradigm acts as a base for academics working in the new paradigm. In normal science, diverse methods and sub-theories are created to make the paradigm sophisticated. For Kuhn, overly frequent paradigm shifts are the expression of an immature science.

2.2.3 The Sociological Definitions of the Concept of Paradigm

What has to be primarily considered in the controversy over the applicability of paradigm theory to social inquiries is the sociological definition of the concept of paradigm as distinct from just adopting Kuhn’s theory *carte blanche*. There have been doubts about the exact concept of paradigm. Most of them focus on Kuhn’s overly loose use of the term paradigm. Actually, Masterman (1970) catalogues twenty-one different senses of the term in his book.

However, there have been diverse efforts to define the concept of paradigm in the context of each social science's discipline. McDonagh constructed a definition from Kuhn's diverse usages of the term:

A paradigm is an [mental] organizing principle which can govern perception, helps determine which facts are gathered in scientific activity, and is a standard upon which to recognize [judge] the existence of an 'error' or 'anomaly' and thus, allow the recognition of a possible 'problem' caused by the error or anomaly. Textbooks are the repositories of scientific paradigms (1976, p. 54).

Hollinger looked at the term as a traditional set of operating principles in applying the concept of paradigm to the history of society. As Hollinger summarizes:

Kuhn's notion of the "paradigm," ... embodies the sense that activities are defined and controlled by tradition, and that tradition consists of a set of devices, or principles, that have proven their ability to order the experience of a given social constituency. ... Tradition, then, is socially grounded and its function is that of organization. Organization may be achieved through a number of modes and devices, ranging from formal institutions to informal habits and from codes of abstract principles to concrete examples of how problems of a given class have been solved in the past (1973, p. 373).

Friedrichs approaches the concept of paradigm from the perspective of model or reference for the definition of situation. As he makes clear:

A paradigm is an "example", but one that is typically linguistic in base rather than physical, a conceptual reference rather than a perceptual one. But it is a prime example that serves as a common frame of reference, a "definition of the situation that provides a basic focus of orientation. ... Without such a paradigmatic foundation, all problems, all methods and tools, all "facts", and all criteria for identifying solutions are likely to appear equally relevant. With it one is possessed of map and compass, the gradual linkage of percept to concept becomes cumulative and relative routine (1970, p. 4).

Besides these definitions, Dolfsma and Welch defined it as “a set of rules and routines that coordinate the behavior of actors among each other since they make mutual expectations possible” (2009, p. 1088).

In sum, a paradigm in social subject matters is a framework of thinking within which a constituency perceives its contingent problems and conceives solutions. It exerts control over devices, institutions, codes, and modes of contemporary generations of society. A paradigm is the reference of perception and judgment. In other words, it builds the orientation of a specific society. In this vein, when a paradigm loses its relevance in perceiving contingent anomalies, the replacement of social principles including world-view, institutions, and practices has to happen⁴.

As discussed before, humanity is struggling with complicated and entangled anomalies that the capitalist economy has produced. The situation demands a different way of thinking about the perception of problems and creation of prescriptions. In the anomalies that defy traditional solutions, voluble discourse suggests the necessity of a paradigm shift. GG, as outlined above, is claimed to be one alternative paradigm candidate. This study examines the relevance of the “Green Growth” approach in the economy and its appropriateness for contingent anomalies. Whether our generation can solve the contingent crises and introduce a new tradition can be best understood by using the concept of paradigm.

2.3 The Conditions of Paradigm Change: Value and Power Structure

As described above, a paradigm in social science is the way of thinking through which a society establishes its orientation and conceives solutions to

⁴ In section 2.4.1, paradigm shifts in economic thinking are described.

contingent problems. Modes of life, institutions, and practices are organized on the basis of a paradigm. In this context, a new paradigm must be based on a different belief system from that of the old paradigm. For example, throughout industrialism, the material expansion in the scale, i.e. economic growth as estimated by GDP, has been regarded as progress. The previous paradigms in South Korea have consistently sought material expansion. It has been a benefit to Koreans who have struggled in poverty. In this milieu, the material expansion embodied in GDP, it has been believed, secured progress and individual's happiness. The Environmental Kuznets Curve (EKC) represents this idea. The concept holds that pollution and environmental degradation follow a u-shaped response as economic development increases. The EKC postulates that during early economic growth there is inevitable environmental harm, but when incomes rise, there will be an investment in environmental remediation. In the realm of the occidental economic development, the EKC has been the conventional wisdom. However, this occidental economic ideology has revealed its limitations. Although the unprecedented growth of economic scale of Korea broke the fetters of poverty that had afflicted a great number of Koreans as late as the 1960s, it also has detrimentally impacted the ecology on which humanity depends. For although some environmental protection parameters conform to the EKC thesis, many problems continue to worsen with continued economic growth, notably those without low-cost technological solutions. As long as the myth of the expansion of input and output endures, this concept will continue to provide a rationalization for economic growth by major economic institutions and other stakeholders with vested interests. In this reasoning, a paradigm shift has to be followed by the change of belief system.

The other requirement of a paradigm shift is a change in power structure. The change of value that is axiomatically associated with a paradigmatic change at the broadest scale of social activity, such as the relationship between the natural and social worlds, brings about the holistic change of society and it inevitably involves a power shift in every realm of humanity's life such as the political arena, markets and individual relations. When a certain value rises in prominence and becomes a guide for public life (Flyvbjerg, 2001), this causes a change in the power structure of society. In other words, a new paradigm establishes who the losers and winners are in the new system. The bourgeois class rose as a ruling power, for example, with the advent of Industrial Society. Feudal aristocrats made way for the new ruling class and faded into the mists of history. Some (but not all) of the most pernicious anomalies that suggest the need for a paradigm change have been begotten by the power dynamics upheld by the existing paradigm. Current crises such as climate change, environmental degradation, social polarization, resource depletion, and continuing economic stagnation are negative by-products of the prevailing political economy. In this context, the examination of power structures in the social inquiry reveals the concealed causes of afflictions and effects of policies. Nonetheless, power structure as a crucial factor forming the character of society has been neglected in many social inquiries. Flyvbjerg (2001) pointed out the weakness of Habermas's argument in that he barely considers that power relations can hinder democratic decision-making in every aspect and level of humanity's life. As Flyvbjerg noted,

Habermas himself mentions lack of 'crucial institution' as barriers to discursive decision-making. But he has little to say about the relations of power that create these barriers and how power may be change improvement in welfare, and reinforcement of basic human rights that could help lower the barriers. In short, Habermas lacks the kind of

concrete understanding of relations of power, which is needed for political change (2001, p. 93).

Without examining the change of power structure in various levels of power relations, one cannot conclude a paradigm change. It is because despite the ruling entity's argument of value change in its society, if power relations remain unchanged, the failure of paradigm change is assured.

Those who adhere to the doctrine of classical liberalism and its newer forms, e.g., libertarian conservatism, consider the capitalist economy to be commensurate with egalitarian democracy. However, the current trend of the economy has exacerbated inequality between the rich and the poor. The implantation of industrial capitalism into developing economies has shown that the rich tend to absorb the wealth created in the process of economic expansion (Redclift, 1987). The capitalist economy has generated obvious winners and losers. The current situation appears deadlocked amidst perpetual economic crises in most Western developed nations. Its belief that the accomplishment of quantitative economic growth can be a panacea for modern problems is collapsing. The expansion of output has accelerated climate change and is finally threatening the ecosystem and humanity's wellbeing per se. No candidate paradigm that maintains the capitalist status quo of a structure with a class of persistent winners and a parallel class of persistent losers can be considered a true paradigm shift for addressing the ever-exacerbating inequality and environmental degradation we are witnessing today.

In this study, the core characteristics of the PP as criteria for verifying a change in the paradigm are identified in chapter 4. Those include: the belief that material growth is progress per se, the confidence in the Progressivism of technological change, the efficacy of a coalition of the government and market, the mastery over

nature, the abundant energy system, and the embrace of governance by experts and bureaucrats. All of them have been prime values in the PP and the systems generated on the foundation of those values created specific power structures. To verify a paradigm shift of GG, the KGGI is analyzed to see whether those six characteristics still persist in the KGGI. The analysis is implemented upon the viewpoint of value and power structure. In other words, it is the main concern of this study to see if the diverse programs of the KGGI repeat the inherent value expressed by the six characteristics listed above and whether it reproduces the same power structures as them.

2.4 The Intellectual Tradition of the Present Study and Paradigm

2.4.1 Paradigms in the Economy

From the era of Adam Smith up to our contemporary society, industrialism has developed through several paradigm shifts before it arrived at the present PP. The first paradigm shift was the establishment of capitalism, as documented by Adam Smith in the 18th century. Capitalism was a crystal clear transformation in political economy. Smith clearly illustrated the reality of the shift that was proceeding in society and constructed a theory of political economy that the new era needed (Heilbroner, 1999).

The second paradigmatic shift was a marginalist revolution. The marginalist discipline led a breakthrough in the mode of economic study and this change strongly influenced economic practices in reality. Before the marginalist revolution, while economists had concentrated on the macroeconomic operating system, marginalists' interests lay in explaining individual equilibria at the micro level. They assumed the

premise that the political economy of capitalism was fixed as a universal law and there was no reason to further that premise. This belief was rooted in the economic progress of the late 19th century. Real wages were beyond the minimum level needed for the survival of the working class and population growth was declining (Sandmo, 2011). They did not think that the classic theory led to the dire predictions predicted by authors such as Ricardo, Malthus, and Marx. Rather, they sought a new political economy that was valid to explain economic progress. They introduced mathematics and statistics to economic analysis and expanded the realm of economics to aspects of everyday economic life.

The marginalist tradition, which reduced values to quantifiable utilities, has been succeeded by neoliberalist economists represented by Milton Friedman. As economic issues came to dominate other social issues, the academic trend of economics strongly influenced other studies such as politics, psychology, and sociology. As a result of the dominant power of the marginalist discipline, economists neglected to watch over social phenomena in a critical way or conceive a new political economic system.

The Keynesian Revolution made the state a critical player in the economy. Before Keynes, state intervention in the economy was very limited. However, during the brutality of the Great Depression, Keynes maintained that government has to fill the gap between consumption and supply to achieve market equilibrium (Klein, 1961). After Keynes, the state has become a strong agent in operating the economy.

In surveying the course of economic philosophy in modern society, Karl Marx's influence must not be overlooked. Unlike the other successful stories of paradigmatic change, Karl Marx saw through the inherent contradiction of the

capitalist system and negated the market principle that was hoisted as an omnipotent power by Adam Smith. He predicted the end of capitalism by its inherent contradictions (Heilbroner, 1999). Marx argued that the spirit of the free market is an underlying force of greedy money-seeking by capitalists. His work led to the birth of socialist experiments that created a planned economy under the control of a central organization. His thinking undermined the philosophy of free will and liberal humanity that are the foundation of the modern society and economy. It was an attempt to change the prevailing world-view through which modern society looked at social phenomena. His ideas were further intended to establish a mechanism to govern society, but history has demonstrated that his revolutionary experiment was a failed dream.

Each paradigm has reflected its contemporaneous society's context, formed the reference for value, and bound society's thinking. The latest post-positivists are represented by neo-liberalism. In prior eras, the creation of normative laws for economic structure was a central part of paradigm change. For Adam Smith, addressing brutality after the dissolution of the feudal economic system was crucial. Marx maintained a concern for empowering the majority of people to achieve a more egalitarian society. However, under the dominance of the neo-liberalist paradigm, value for justice has not been a central interest of economic research. It was the result of two factors in the economic community. The one is a confidence in capitalism as the ultimate system to which humanity can arrive and upon which is based the unprecedented economic success, in terms of quantity, that society has achieved. The other was an academic trend in the economic discipline that tried to consider

economics as a science. This tendency resulted in removing value and humanity from the economics discipline. As Mosini noted,

The parallels just identified between Friedman's influential thinking and the progress achieved by the neoclassical synthesis in the early 1950s led to an abrupt rethinking of the positive-normative distinction along Friedman's line; the terms positive and normative came to be understood as being in direct opposition with one another, which explains Hick's claim ...anti-normative tendency run through the discipline (2012, p. 58).

Currently, the need for a paradigm shift in the economy is strongly emerging. Several trends highlight the necessity of a shift. Specifically, present phenomena in the global economy, erupting civil disobedience protests such as Occupy Chicago and Occupy Wall Street, and the emergence of strong alternative theories from the "social greens" who combine scholarship with activism, most prominently Jeffrey Sachs, Vandana Shiva, and David Graeber (Clapp & Dauvergne, 2008). These events can be interpreted as evidence of heightened tension between maintainers of the present economic system and paradigm breakers. Conventional and institutional powers are trying to continue this system by incorporating prescriptions that are antithetical to the prevailing regime. The winner of the two parties' conflict hinges on the emerging party's ability to reveal the reality of the contemporary world.

2.4.2 The Limits on the Production of Effective Knowledge under the Regime of Positivism

A problem occurs in the way theories produce knowledge. Social study cannot be a science like natural science. The law of gravity, namely that physical bodies attract with a force proportional to their mass, may remain an unchangeable truth forever if there is no definitive evidence for falsification. By contrast, knowledge in social science is essentially contingent. This is because the subjects of social study are

based on human relations, specifically the power relations within humanity. That is to say social phenomena are outcomes of various power relations within humanity. Human relations continue to change depending on the context of society, therefore, it follows that objective observations of society are not possible and these cannot be used to formulate universal truths as might be done in the natural sciences. Therefore, the function of knowledge as it relates to society is that it has to show people the reality of life and facilitate popular participation in deciding rules that regulate their lives both at an institutional level and at every aspect of everyday life. The research of this study will be implemented on the basis of this perspective on the role of knowledge. The positivist discipline has omitted the detail of real life and power relations through the processes of objectification and instrumental rationalization. This tendency has helped to conceal the oppressive and violent reality of modern society in relations within humanity as well as between humanity and other species.

2.4.3 Value Rationality: *Phronesis*

This study will be different from the positivist approach in that it rejects the notion that seeking knowledge has to be neutral. As described above, a paradigm change begins with doubts about the validity of the grounding principles of the PP and it eventually invalidates the tradition of the current paradigm. Nonetheless, a candidate paradigm grounded in the value system of the PP could inherit the power relations embedded in the current paradigm that generated anomalies. In that case, the embedded power relations will reveal the candidate paradigm's limitations as an alternative. Therefore, this study will place values at the center of the discussion and focus on narrating the reality of political economy in the GG discourse. In other words, this is an inquiry about an emerging paradigm in terms of value rationality. For

that, I will incorporate the *phronetic analysis* (Flyvbjerg, 2001) originated from the Greek philosopher Aristotle to examine GG.

Value rationality is based on Aristotle's *phronesis*. Modern rationalism traces back to the Greek philosophers Socrates, Plato, and Aristotle. However, unlike his predecessors, Aristotle distinguished between the intellectual virtues of epistemic science, which put an emphasis on theories and universals, and the intellectual virtues related to humanity's affairs, which have to deal with context, practice, experience, common sense, intuition, and practical wisdom. Aristotle named the latter intellectual virtues as *phronesis*. Whereas Socrates and Plato focused on scientific knowledge that can be generalized and applicable transcendent of time, space, and subject matters, Aristotle thought that an attribute of knowledge differs according to the subject of knowledge. He classified knowledge in three categories. According to Flyvbjerg's summation, one is *Episteme*. This is scientific knowledge, which is universal, invariable, and context-independent. It is based on general analytic rationality and the original concept of today's "epistemology". Another is *Techne*. This is knowledge related to craft or art. Therefore, this kind of knowledge is pragmatic, variable, and context-dependent. Due to its production-oriented characteristic, it is based on practical instrumental rationality governed by a conscious goal. This concept is seen in the use of technique and technology today. The last one is *Phronesis*. *Phronesis* is value, or a deliberation about what is good and advantageous for humanity. Thus, *phronetic analysis* concerns the analysis of values and becomes the point of departure for action. It is inevitably variable for specific cases and cannot be epitomized by universal rules because it presupposes value judgment (Flyvbjerg, 2001). As Aristotle noted,

[P]rudence [Phronesis] is not concerned with universals only; it must take cognizance of particulars, because it is concerned with conduct, and conduct has its sphere in particular circumstances. That is why some people who do not possess theoretical knowledge are more effective in action (if they are experienced) than others who do possess it. For example, suppose that someone knows that light flesh foods are more digestible and wholesome, but does not know what kinds are light; he will be less likely to produce health than one who knows chicken is wholesome. But prudence is practical, and therefore it must have both kinds of knowledge, or especially the latter (cited in Flyvbjerg, 2001, p. 58).

Aristotle's description of *phronesis* demonstrates that the *phronesis* concept is an effective choice for this study in that it can provide a new way to deal with new realities that our contemporary world faces. It is a junction point where the paradigm theory and *phronetic* analysis meet. Kuhn's paradigm theory focuses on particular episodes in a particular community at a particular time rather than grand developmental laws that abstract circumstances surrounding humanity. As Hollinger noted,

A historian concerned to explain a given temporal episode might find that Kuhn's vision frees the historian from grand developmental formulas and enables him to focus more directly on that episode, in its particularity (1973, p. 376).

For Plato and Kant, who are founders of occidental rationalism, there exists a cosmic order that becomes a reference of judgment for what is good or bad for social actions, but for Aristotle, knowledge about human affairs has to be based on common sense because what is good or bad for humanity is based upon humanity's experience and social context. In this study, new realities will be judged not by the prevalent cosmic order but rather by *phronesis*, in other words values and common sense.

Traditionally, in *phronetic* analysis, research proceeds by asking three questions:

1) Where are we going?;

2) Is this desirable?

Later, Foucault extended *phronetic* analysis by adding the concept of power relations. He thought that power is present everywhere, even where an ideal institution is operating. In this context, he criticized Habermas who tried to construct a general theory about conditions for the ethics of discourse in which humanity can participate in social discourses equally. In reality, despite the existence of constitutionally- or institutionally-derived structure for the ethics of discourse, the conditions of people who participate in social discourses are different and this difference creates social injustice. Focusing on the construction of a general theory neglects the power relations happening in the context of real lives. Foucault understood human relations in every aspect of life as power relations. Thus, without deep insight into power relations, people cannot obtain true freedom. For Foucault, the role of true knowledge is to reveal power relations, that is, “who gains and who loses?” His goal was to make people resist the power dynamics that suppress their freedom (Flyvbjerg, 2001).

Some worry that *phronesis*, as it is modified in the work of Foucault, reduces analysis to personal judgment. With no standard to question personal judgment, *phronesis* might be a recipe for relativism. While this concern is valid, there are steps one can take to prevent the devolution of *phronesis* into relativism. Asking the four questions: Where are we going? Is this desirable? Who gains and who loses? represents an effort to learn community scale and even societal scale values, and not simply the inquirer’s personal values.

A candidate alternative paradigm, GG, is being developed through diverse actions and reactions. As GG is implemented in the real political and economic world,

GG stakeholders attempt to shape institutions and practices to make them advantageous for their own sakes. Each moment of formulating GG represents continuous power conflicts. From the definition of GG to the goal setting, and from the introduction of new legislation and funding programs, some parties have to be losers and others will be winners. In these interest conflicts, each party mobilizes its resources to lead the battle and be victorious. The results of each battle are shaping the true feature of the candidate paradigm. If the features of the new candidate paradigm in a certain community are examined thoroughly, we can judge whether it is a real paradigm that can free the contemporary generation from contingent apocalyptic anomalies or whether it simply conforms to the old paradigm. Also, we can delineate the features and the direction of the new paradigm.

This study examines a claimed new paradigm GG in the perspective of *phronesis*. In other words, if GG continues the values of the old paradigm, it is only a variation of the old one.

Chapter 3

SCHOOLS OF THOUGHT ON DEVELOPMENT, HUMANITY, AND ENVIRONMENT

This chapter describes the modern anomalies that have been produced by industrialism and the different solutions proposed by four types of social theory: market liberals, institutionalists, bioenvironmentalists, and social greens. Each offers views on the causes of environmental degradation and how the political economic structure can be repaired (market liberals) or changed to resolve modern anomalies. Understanding these different viewpoints is critical for understanding the nature of the different policy initiatives dedicated to addressing modern anomalies, as well as for envisioning the kind of world that will be created through these policy initiatives. This chapter's discussion of these four main schools of thought on modern anomalies will be used to explain how GG is being proposed as a new paradigm by its proponents. Furthermore, examining each perspective will help us to understand the ability (or inability) of GG to provide a theory which might guide a paradigm shift in thinking.

3.1 Market Liberals

Market liberalism has been the predominant ideology of the modern world. This ideology is founded on the belief in market and the ingenuity of humanity. To recap the previous description of market liberalism, it features promotion of economic liberalism, egotistical individualism, free markets, meritocracy, minimal states, and utility maximization. The phenomenal material progress of the modern capitalist society has made modern people believe it as a truth. However, anomalies that have

been emerging with the maturity of capitalism representatively including environmental deterioration, ever growing inequality, and resource depletion are threatening the legitimacy of market liberalism as a prime ideology based on ideas of representative theorists such as Friedrich Hayek, Milton Friedman, and Ayn Rand.

3.1.1 Poverty and Lack of Property Rights

Nevertheless, market liberals never doubt the authenticity of their beliefs. This confidence mainly comes from their trust in the power of the market. In the world of market liberalists, people are perceived as “Homo-economicus” who are driven solely by material interest and pursuing it rationally (Dryzek, 2013). The market is the most efficient system to secure rational Homo-economicus the most (economically) rational resource distribution.

For them, failures such as environmental problems and inequality stem from the failure of the market. In other words, if the market operated appropriately, they believe failures would minimize result. Specifically, market liberalists find the main cause of the anomalies to be from insufficient economic growth and incomplete definition of property rights.

First, they believe that poverty is what causes environmental degradation. This view has provided legitimacy for the proliferation of the occidental development path in the developing world. Their explanation is that people in the Global South whose sustenance heavily depends on natural resources cannot help but overexploit nature to survive. It is destined for them to abuse nature around them because they meet most necessities for their living from nature and they do not have alternatives for their sustenance but from nature. Thus, economic growth, i.e., industrial development, they believe, is a core precondition for environmental protection and equity.

The belief of market liberals can be exactly illustrated with the idea of Kuznets Curve (Kuznets, 1955; Stern, 2004) described in section 2.3. According to this theory, once a society becomes wealthy, the environment rises as a concern among people and this leads businesses and governments to raise environmental standards. Also, the accumulated wealth in society provides nutrients for the growth of a middleclass. The *Economist* magazine describes the path of Kuznets as the global pattern:

Where most of the economic growth has occurred—the rich countries—the environment has become cleaner and healthier. It is in the poor countries, where growth has been generally meager, that air and water pollution is an increasing hazard to health (cited in Clapp & Dauvergne, 2005, p. 5).

Second, market liberals also find the cause of environmental problems from the lack of property rights (Anderson & Leal, 1991; Meiners & Yandle, 1993; Mitchell & Simmons, 1994). For Homo-economicus, it is a rational choice to use public land and watersheds that are provided at a lower price than their own property. The liberalists think environmental degradation occurs by externality because it is not reflected in the market price due to its misspecification of property rights. Market liberals argue that (most) natural resources and ecosystem services are common pool resources and without assigned property rights of ownership, a condition that encourages selfish behavior by consumers and causes excessive consumption with resulting environmental harms. Their solution, in short, is privatization whereby resources and services are transferred to private ownership so that a measure of environmental protection is in the interests of the owners. Programs of privatization have been advocated for a wide array of environmental phenomena, including wildlife conservation, forestry, fishing rights, and genetic preservation. Creation of such property rights is an essential component of market-based environmental protection.

For example, the overgrazing of open land is resolved by the enclosure of pasture. Owners of the land come to protect it by developing operating land usage plans. Overgrazing decreases the value of the property. Similarly, they hold that the property rights of genes prevent the extinction of species. The genes that are endangered in nature can be conserved in the lab of pharmaceutical companies that obtain the property rights of them.

3.1.2 Market, Technology, and Economic Growth

The main agents responsible for addressing modern market anomalies for the liberalists are corporations and rational consumers. Administration is required to provide the architecture to facilitate an efficient market for corporations and consumers to make rational choices rather than directly intervening in markets. In this sense, market liberals confine the role of government to eliminating factors that lead to market failures. Their solutions to modern disruptions reinforce the market function. They pursue removing institutional obstacles in the existing markets and building markets in the fields where there is an absence of the market so that the “invisible hand” can function.

To remove failures in the existing markets, they believe, the remedy has to be targeted to eliminate manifold institutional irrationalities. For example, subsidies to mining, logging, and agricultural industries encourage overuse and waste causing market distortions and environmental degradation. Subsidies also undermine incentives to develop environmental technologies, e.g., fuel subsidies have been an obstacle to expanding the use of fuel-efficient technologies. Market liberals also believe that it is a core responsibility of the government to remove regulations that prevent the market from drawing out optimal outputs, as such regulations are

preventing economic players from creating the most efficient means to improve total social utility.

The establishment of property rights is another crucial avenue for resolutions through the market. The marketization of the commons market liberals believe, creates economic incentives for self-interested entities to discover the social equilibrium of pollution. The specification of property rights has mainly been implemented in relation to land where it is comparatively easy to identify ownership. However, the trend of environmental degradation has been expanding to every corner of the commons encompassing water, genes, and sky. Climate change is apocalyptic to humanity as well as the whole ecosystem. The sky is shared by the global community and it is a difficult realm within which to define the boundaries of ownership. For addressing those realms, “quasi-market incentives” (Dryzek, 2013) are created. The concept is to grant a certain amount of tradable rights to pollute to the agents of contamination. This scheme premises that trades of rights lead to the equilibrium of pollution in the most efficient way. In detail, polluters with low pollution reduction costs sell their rights and others with the high costs purchase rights in the market. Through those transactions, the social cost for pollution reduction becomes minimized and society can meet the target reduction⁵.

Another pillar of the market liberalist’s belief system is a faith in technology, also known as technological optimism. Technology is a key factor that has shaped modern society. Material progress and the rise of modern science liberated humanity from the ancient travails of arduous labor and disease, at least those fortunate enough

⁵ The reality of cap and trade scheme, which is a representative program of quasi-market incentive system, is discussed in Chapter 6 in detail.

to be its beneficiaries. Through technology, humanity could subject nature to its rule. Technology, market liberalists believe, can present human society solutions to modern crises that can be traced to technological progress. The human ingenuity that is embodied in technology can manage and control the environment in a virtuous way for humanity's sake.

Rosenberg believes that environmental degradation is the choice of human society, rather than any limitations or inadequacies in the technologies available to address environmental problems. He argues that there already exist diverse alternative technologies and the state of the art of technologies to provide an adequate level of environmental protection. Nevertheless, society has adapted the cheapest and most profitable technologies rather than environmentally friendly ones. If the consensus is that environmental degradation is identified as an externality and social costs from it have to be incorporated in the social system, environmental problems are figured out by technology:

We could eliminate much of it if we decided-or allowed ourselves to be persuaded-that we were prepared to give up some portion of our material output in exchange for a more attractive and livable natural environment. Everyone wants unpolluted rivers and streams, just as everyone (at least everyone I have spoken to) laments the death of Lake Erie (1971, p. 550).

Technological determinism pervades most societies. It is often believed by government actors that the level of technology determines each state's economic and ecological competitiveness. In practice, technological innovations occupy the top priority of each state's policies, policy papers of international institutions, and international talks⁶.

⁶ Technological optimism is discussed in Chapter 4 in more detail.

Economic growth is a prime value for market liberals. Growth is not valued for its own sake, but because it represents an increase in material wealth that creates contemporary prosperity, increases economic opportunity (such as employment) and choices, and creates new capital that can be invested to ensure future growth, such as in technology. Growth is also seen as strengthening social institutions that benefit wider society, provides surpluses that can be directed at social welfare, and can lessen the potential for conflicts over resources and the costs that come from disputes over resource allocation (with the argument that diminishing prosperity fosters discontent and social disruption). Conversely, the lack of growth is considered the cause of modern disturbances and strong growth provides humanity with the means to manage and control the environment. Economic growth is crucial for both the rich and the poor. For the poor countries where poverty results in social, economic, and ecological problems, economic development is a pre-requisite for solving their difficulties. Slow economic growth in the rich countries becomes a barrier to the development of clean technologies and investment for a clean production system (Clapp & Dauvergne, 2005).

In the fervent support of market liberalism, globalization pursues one world market in which goods and capital freely flow across borders and common prosperity is brought to the developing and developed world alike. Large corporations play the title role in the globalized economy. International organizations led by the Global North such as WTO, IMF, World Bank, etc. provide institutions, governances, rules, policies, and capital to remove barriers for free trade (Wade, 2004). As a representative case of free trade, Foreign Direct Investment (FDI) is believed to drive economic development in the Global South (Gori, 2015; Kumar, 2015; UNCTAD,

2014). At the same time, diverse ways of foreign investments facilitate the amelioration of environmental disruptions by transferring both cleaner technology and better environmental management practices to developing countries (UNCTAD, 2014; Cantwell, Dunning, & Lundan, 2010). Actually, across the world, from Sub-Saharan Africa (SSA) to South-East Asia, Russia, and Latin America, hunger for Foreign Direct Investment (FDI) exploded. Private flows of FDI increased exponentially after 1990s (UNCTAD, 2010). In this context, FDI has heavily impacted the economy, environment, and society of host countries.

3.2 Institutionalists

Institutionalists share many values with market liberals. First of all, they have common ground in the belief that modern problems such as growing environmental degradation and inequality can be figured out in the current political economic system (Clapp & Dauvergne, 2005). Also, they find the source of the problems from the same source that marks poverty as a market failure. What makes a difference between them is their respective trust in the market. Market liberals believe that market is almighty. As discussed above, failures, they believe, occur in the realm where market is not built or where there exist various obstacles that hinder the operation of market. They seek solutions that will help build perfect market conditions while also doubting the natural supremacy of the market—a belief that has been central to the modern paradigm. They believe in technology, economic growth, and globalization. Where their thinking differs is in their concern that leaving everything to the market may result in the aggravation of environmental degradation and inequality. They find a solution from the form of government intervention at the level of the nation state and international regimes to direct good environmental practices, technology transfers, and stimulations

of the flow of funds from the rich world to developing countries. They basically deny the worth of ‘marketism’ to solve the modern paradigm’s anomalies. Ideologically, institutionalists spread across a range of environmental discourses that arguably cover the progressive approaches of ecological modernization as well as the administrative rationalists, into which some conservative beliefs, such as strong states and authoritarianism might be included.

GG has its roots in the institutionalist perspective that was developed and has been developed by advocates of SD. In the recent discourses of SD, there has arisen a wide range of ideas regarding its definition and the prescriptions it should advocate. Of the diverse voices related to SD, the institutionalists compose the mainstream group of SD represented by major international political and economic organizations such as the UN, World Bank, the OECD, and a majority of the rich countries. During the initial stage of SD discourse development that emerged with the 1980 World Conservation Strategy, the focus was on a declarative and normative ideal toward which humanity should progress and real applications of its directives were limited to programs in a few developed countries. The applications of SD realized in a few European countries, including Germany, the Netherlands, and Sweden, and in Asia with Japan, feature manifestations of EM. Since 1980’s, those countries introduced institutions and policies that promote reforms toward green development. Also, these governments invested heavily in clean technology research and development. The reforms of those countries are found in their GG initiatives that share many of the same features. SD and EM are discussed in chapter 6 in more detail. An examination of the core concepts underpinning institutionalists’ ideas contributes to our understanding of the attributes upon which GG is based.

3.2.1 Sources of Crises: Poverty and Lack of Global Cooperation

Just like market liberals, institutionalists think that poverty is the main cause of environmental degradation and inequality (Clapp& Dauvergne). Their belief is also based on the EKC theorem that the poor are the main agents as well as victims of environmental degradation. Their perception about poverty as a source of modern problems is same as market liberals although their interest focuses on population growth (Clapp& Dauvergne). They indicate a strong concern about the trend of population growth, especially in the region in need. In this region where most of the population entirely depends for their sustenance on the ecosystem, the rapid population growth results in a situation where people are forced to cultivate even ecologically weak land and this leads to an accelerated ecological destruction (Nunan, 2015). The population growth issue has been the key concern of international organizations since the international governance for environmental improvement and poverty eradication began. Representatively, the Brundtland Report that started the momentum to make SD an international policy agenda, stresses the nature of poverty as a key cause of environmental degradation in the developing world:

But poverty itself pollutes the environment, creating environmental stress in a different way. Those who are poor and hungry will often destroy their immediate environment in order to survive: They will cut down forests; their livestock will overgraze grasslands; they will overuse marginal land; and in growing numbers they will crowd into congested cities (World Commission on the Environment and Development, 1987, p. 28).

Unlike market liberals who believe market is the cause of failures as well as the only avenue to solve modern problems, institutionalists think that failures stem from the lack of international cooperation. It is closely related to the characteristic of modern environmental degradation and its solutions. The trend of environmental

degradation is across borders and affects the life quality of all human beings regardless of their location. Deforestation in the tropical region affects the density of CO₂ in the air and contributes to global warming. Marine pollution disturbs the ocean food chain. The toxin that is moving upward through the food chain threatens the whole of mankind. The feature of environmental crisis in the contemporary world is a new phenomenon that the traditional political economic system has never experienced. As the whole world is intertwined in the cause and damage of the environmental degradation, institutionalists believe that the international governance has to play a role to draw out the international cooperation to solve this problem. Especially, the nature of the environmental catastrophes that contributors to the crisis are not always its victims reinforces their belief that the market cannot figure out how to rectify this externality of the modern economic system. A case of a multinational corporation that has its production facility in the Global South vividly demonstrates this issue. Goods produced in the production facilities are enjoyed by mainly people in the Global North and economic rents are distributed to the shareholders of the company, but CO₂ and polluting debris and material discharged from the production process are shared by the whole humanity. Thus, they stress the importance of international governance that makes the technology transfer from the Global North to the Global South happen and raises and distributes international funds to help bring about SD in the Global South.

3.2.2 Doubts about Market Utopia

Institutionalists are skeptical about the market utopian worldview of neoliberalists. They believe that state or international governance has to intervene to prevent the market system from causing the catastrophes of capitalism. Their doubt about the market is based on the critique of Karl Polanyi about “Market Utopia”

(Lacher, 1999). Polanyi (1957) believes that the market economy that independently exists separated from society has been the source of modern catastrophes such as human inequality and the destruction of life surroundings. According to Polanyi, the destructive nature of market economy stems from its being “disembedded” from society. Before the market economy, the market was subjugated to society that was the place where the exchange of products for subsistence occurred on the basis of “reciprocity” and “redistribution”. In this sense, transactions in the market reflected social relations, values, and institutions of contemporaries. However, the market was transformed with the advent of industrialization. The market regulated by only market logic, which is argued, is completely separated from social values (Lie, 1991). Under the logic of self-regulation, “labor, land, and money” (Polanyi, 1957, p.68) that are human beings themselves and the surroundings where they exist become commodities transacted by market prices and are treated only within the view of profits. The commodification of labor, land, and money, Polanyi insists, causes the subjugation of society to the market system. In this milieu, inequality among human beings and the exploitation of nature are not big problems, as long as the system faithfully serves for the value of the market system faithfully responds to market values, i.e., the maximization of profit and efficiency.

Market utopians argue that the modern world has experienced the unprecedented improvement of living standard and phenomenal wealth by separating the market system from political decisions. But Polanyi refutes their argument by claiming that any market system is not free from institutions. Rather, the modern market system, he maintains, has been underpinned and shaped by political decisions. He sees that the nature of the market system is the result of legal arrangements

favorable to capital (Somers & Block, 2014). To prevent catastrophes that the disembedded market begets, he believes, institutions embodying society's ethics and cultural context have to actively intervene in the market operation.

Polanyi's interventionist idea manifests in the intuitionists' tradition. Institutionalists take adverse phenomena of modern society far more seriously than market liberals. They worry about the fact that the market system indifferent to social and ecological values worsens the crises. They believe that institutions and international governance must play a role in securing the common good by pursuing an SD pathway that does not harm the ecosystem for future generations.

3.2.3 Globalization and Global Governance

Institutionalists also find solutions to crises from economic growth. Also, they show strong trust in technology as means to reduce the burden on the ecosystem and generate wealth. For them, it is the biggest concern that the capacity of technology and economic growth is concentrated in the Global North. This creates inequality among regions and hinders international cooperation to address the ecological crisis. They think that economic globalization can overcome this obstacle. However, they make clear that globalization led and regulated by only market mechanisms is not the answer for the crises. The market is the basis of globalization though it has to be operated in harmony with common goods. In this sense, they put an emphasis on building "global-level institutions and agreements to more actively guide economic globalization" (Clapp & Dauvergne, 2005, p.27).



Figure 3.1: Institutionalists' Solution to Crises.

Figure 3.1 illustrates the mechanism through which SD is achieved in the world of institutionalists. Globalization becomes the source of progress by proliferating advanced technologies and the enabling economic growth across the world. What leads globalization to SD is technology transfer and funds that act much like a pump does for water to help power the SD of the Global South. For the equitable and smooth flow of technology and funds, international governances and, each state and international-level legal arrangements have to be established. The UNEP well depicts this process:

If developing country institutions can be adapted to benefit from the new technologies and the emerging borderless economy, and if appropriate forms of global governance can be created, the rising tide of prosperity will lift everyone to new heights of well-being (2002, p. 329)

Institutionalists believe that it is not sufficient to leave the responsibility of environmental improvement and the improvement of the standard of living only to

market forces. A stronger global regime has to be formed in a way that the Global North, which has more capacity, takes much more responsibility and the Global South, which has made fewer burdens on the global environment, takes aid from the Global North to develop its economy sustainably. In the end, institutionalists hold a strong belief in the economic system of the modern world; economic growth guarantees progress and humanity's well-being; the universalization of occidental development path is a common good for the whole of human beings. Their reformism is to defend the modern economic system that has been undermined by mushrooming aberrations. The essence of their confidence lies in that the revision of the "jungle law" of the market economy recovers the ethics of society and secures the sustainability of system, human beings, and ecosystem.

3.3 Bioenvironmentalists

Unlike market liberals and institutionalists who believe economic growth is a positive force for the environment and social justice, bioenvironmentalists and social greens oppose these ideas. Bioenvironmentalists focus on the carrying capacity of the Earth, a concept drawn from ecology, which argues that the ecosystems supporting human life have a limited capacity for this task, so that excessive demands on ecosystem system services and natural resources will diminish these to the extent that human welfare is lowered. Whereas the pro-growth camps think that modern technics such as advanced technologies, efficient management skills, global economic organizations, advanced institutions and smart policies can expand the earth's capacity infinitely, bioenvironmentalists refute pro-growth parties' argument from the

viewpoint of the law of entropy⁷. They argue that the earth's capacity is finite and the planet has already exceeded these limits, as shown by the onset of numerous global environmental crises of human origin. They call for human beings to address this ecological crisis immediately. Bioenvironmentalists demand limits on the growth of the global economy that has been believed to be progress per se. Also, they required urgent actions to stop exponential population growth beyond the planet's capacity. Population stabilization has been a strong theme in this school of thought given that, in ecology, when population exceeds carrying capacity, there is a subsequent catastrophic population decline.

3.3.1 An Oxymoron, Sustainable Growth

Bioenvironmentalists are skeptical of the SD concept of pro-growth camp. They contend that the SD of pro-growth camp actually means sustainable growth that is impossible in a closed system, hence it is really an oxymoron. Daly (1996a), an ecological economist who represents the bioenvironmentalists camp, differentiates SD from sustainable growth. He maintains that the ability of the earth to provide material resources and absorb wastes is finite due to "the law of entropy". According to this law, the capacity of Earth's metabolism is limited. Nonetheless, human society, Daly maintains, overexploits the ecosystem as if there is no limitation on the metabolic

⁷ The ecological economist Nicholas Georgescu-Roegen (1971) first outlined "the entropy theory" in the field of economics. Entropy is the amount of usable energy or matter in an isolated system. While low-entropy energy or matter is useful and can perform work, high-entropy means it is non useful. The earth is a closed system, so it provides a constant amount of low-entropy. As the useful low-entropy transforms to make a product, the amount of low-entropy decreases and the amount of high-entropy increases.

activity of the earth. He argues that even the utmost level of technology cannot break through the fixed entropy of the universe.

Daly emphasizes that a constantly expanding economy, specifically that of the developed world, is not economical from the perspective of welfare economics. In his viewpoint, the Western economy has already overstepped the optimum level. Under these circumstances, pursuing more economic growth only harms the welfare of society, as Daly notes, “once we have gone beyond the optimum, and marginal costs exceed marginal benefits, growth will make us worse off” (1991, p.101).

He explains that Western society cannot awaken from the illusion of economic growth because the prevailing quantitative measures of well-being, such as GDP and GNP, veil the reality. The veiling effects of those measures have prevented society from seeing the negative side of economic growth such as resource depletion, environmental deterioration, and social pathologies. If those real costs are reflected in the estimation of well-being, it can be shown that the Western World has already entered the period of declining welfare.

For bioenvironmentalists, globalization is an aggravator of modern crises. They do not argue that globalization contributes to economic growth. Rather, they focus on the negative effects that this economic growth brings. This growth intensifies overconsumption in the richer world. Further, the overconsumption of the Western world is promoted as the symbol of humanity’s well-being in the developing world achievable through the spread of globalization. The universalized overconsumption accelerates resource depletion and releases gigantic amounts of waste into the ecosystem. Some bioenvironmentalists believe that the destruction of the ecosystem

will become uncontrollable when the overconsumption pattern is combined with exponential population growth. (Ehrlich & Holdern, 1971).

Besides increasing the human impact on the ecosystem, bioenvironmentalists are disturbed by the worsening inequality of resource distribution that results from economic globalization. They cite the unequal consumption of resources among regions and the concentration of wealth on the minority that results from globalization and the increasing concentration of wealth fostered by globalization. As described in Clapp & Dauvergne:

Rich countries have much higher rates of per capita private consumption (around US\$ 16,000 in 1995) than developing countries do (only US\$300 in much of the developing world). Africa's consumption has actually declined in the past 20 years, while it has risen just about everywhere else. (2005, p. 110-111).

3.3.2 Steady State Economy

Bioenvironmentalists believe that the reducing consumption and constraining the growth of the population and the economy are the only possible solutions to the problems we face (Daly 1994). Bioenvironmentalists put an emphasis on the comprehensive transformation of human behaviors, norms, and attitudes as the only way to allow us to coexist with the biosphere. For them, most of all, changes are critical in the rich countries that are leading the overconsumption pattern and causing the depletion of resources. Wackernagel & Rees (1996) make it clear with their discussion about the 'ecological footprint' that measures human impacts on ecosystem. According to the estimation of our ecological footprint by the Global Footprint Network in 2007, while the world's average bio-capacity was 1.8 global hectares per person, the world's average footprint was 2.7 global hectares per person.

The average footprint per person in the U.S., Switzerland, China, and Nigeria were estimated at 8.0, 5.02, 2.21, and 1.44 global hectares, respectively.

Bioenvironmentalists demand the change of global consumption patterns and the education of individuals to help us live life within limits; to use less, generate less waste, and recycle as much as possible. To try and capture this ethic, Daly (1991, 1996a) proposes the “steady-state economy”. The steady-state economy is grounded on the entropy theory. In the steady-state economy, the number of people and the amount of capital are constant at a level that is sufficient for people to live sustainably. The economy is an open subsystem of the Earth’s ecosystem, which is finite and closed. When the economy grows, other subsystems cannot help but reduce their portion of the whole. Under that circumstance, even though the economy continues to grow, it cannot go over 100% of the global ecosystem. Economic growth, Daly asserts, is not sustainable even if it is green. In this sense, Daly identifies SD as follows:

To grow means ‘to increase naturally in size by the addition of material through assimilation or accretion’. To develop means ‘to expand or realize the potentialities of; to bring gradually to a fuller, greater, or better state’. When something grows it gets bigger. When something develops it becomes different. The earth ecosystem develops (evolves), but does not grow. Its subsystem, the economy, must eventually stop growing, but can continue to develop. The term ‘sustainable development’ therefore makes sense for the economy, but only if it is understood as ‘development without growth’—i.e. qualitative improvement of a physical economic base that is maintained in a steady state by a throughput of matter-energy that is within the regenerative and assimilative capacities of the ecosystem. Currently the term ‘sustainable development’ is used as a synonym for the oxymoronic ‘sustainable growth’. It must be saved from this perdition (1996b, p. 11).

Daly believes that the economy can be changed in a better way to improve human well-being and to develop society without growth. This idea is made clearer by Georgescu-Roegen when he says, “growth is if you get just an increasing number of the same type of mail coach. And if you pass from traveling in mail coaches to traveling by railway, that is development” (1988, p. 294).

Bioenvironmentalists reject the effectiveness of GDP (Gross Domestic Products or GNP (Gross National Product) as an indicator of human welfare. Daly and Cobb developed the Index of Sustainable Economic Welfare (ISEW) in 1989 to identify the real economic benefits and costs of growth. The ISEW measures the per capita personal consumption expenditure by estimating the private consumption, public consumption and the value of unpaid household labors. And then the consumption expenditure is adjusted to reflect costs and is referred to as subtraction factors from consumption. It includes items such as pollution, inequality, health expenditures, population concentration costs, loss of natural capital and various other factors. Besides the ISEW, a diverse group of new indices, such as the Genuine Progress Indicator (GPI), the Sustainable Net Benefit Index (SNBI), and the Living Planet index (LPI), were developed by bioenvironmentalists. Those indices showed largely similar results to each other but that differ significantly from the GDP. These indices all showed that while GDP continued to rise, other factors, such as environmental quality, social equity, and human health, stagnated (Lawn, 2003; Stockhammer, Hochreiter, Obermayr, & Steiner, 1997).

The idea of bioenvironmentalists requires a drastic change in development theory in the sense that they doubt the absolute value of economic growth and technology. They point out the limitations of a SD concept that still adheres to an

infinite trust in economic growth and technology that increased humanity's material accretion at the expense of all other values. Even though orthodox SD stresses environmental considerations and institutional reforms, as long as human society adheres to material accretion, the fate of the planet toward tragedy cannot be stopped. In this way, the bioenvironmentalist perspective represents a break from the prevailing linkage of economic growth with well-being. Nonetheless, the views of some bioenvironmentalists do overlap in some cases with the orthodox pro-growth camp. The most notable point is that their solutions presuppose the dualism of humanity and nature. Even though, historically, the spiritual separation of humanity from nature has provided a critical foundation for the overexploitation of the ecosystem (This is discussed in section 4.4 in detail), they still retain this belief. This perception is demonstrated in their idea that elaborate management can resolve the ecological and associated crises arising from the overuse of the planet's positive entropy. Representing these views is Daly, who analyzes the value of the ecosystem from the viewpoint of the economy. He stresses the role of institutions and effective practices in addressing the ecological catastrophe. It means that nature is under the control of humanity in their worldview. In this point, they still stay within the boundary of positivism.

3.4 Social Greens

The ideas of social greens are similar to those of the bioenvironmentalists, yet they show a clear difference in their approach to solving the modern crises. Social greens do not agree with the idea of bioenvironmentalists that strong population control is a key solution to the exacerbation of the ecosystem. Social greens oppose it because it deprives people's autonomy in choosing their own family's size. Rather,

they believe that solutions have to be sought in reducing the footprint of rich industrialized countries. Also, social greens concentrate on the political ecology of the global system that intensifies inequality within a state as well as among countries and regions while bioenvironmentalists develop their idea on the basis of the physical limitations of the Earth. While market liberals and institutionalists are confident that solutions to modern crises can be found within the global market system or global regimes that bind nation states to environmental stewardship through compulsory rules, social greens are much more pessimistic about the current state of affairs and believe that replacing the modern political economy with a decentralized, community-led economy characterized by the use of appropriate technology is a preferred path.

3.4.1 Commodification of Commons and Technology Transfer

Social greens find the cause of modern crises in the global political economy whereas bioenvironmentalists find the cause in the excessive pursuit of economic growth that exceeds the Earth's ecological capacity. Social greens, moreover, note that social inequality has grown in parallel with the globalization of the economy. In contrast to market liberals and institutionalists who have strong confidence in globalization's ability to provide all human beings with economic prosperity, social greens show strong antipathy to globalization arguing that it only worsens economic inequality and intensifies environmental degradation. In their view, wealth generated by economic globalization harms both richer countries and the developing world. In richer countries, the wealth makes people overconsume and it leads to pollution and resource depletion. The developing world incorporated into the global economy becomes the production base and supplier of resources for the economy of the rich.

This deforms the nature of social conditions and exacerbates the ecological problems of the developing world.

Social greens are mainly concerned over the accelerating commodification of the commons along with globalization. Social greens explain that the source of crises is not poverty but the enclosure of commons regimes that generates poverty in the developing world (Shiva, 1994). The alienation of the people from the commons exacerbates this poverty and places people in a marginal situation. The activity of people in severe need for their sustenance leads to environmental destruction

Social greens believe that technology transfer can become a source of crises when it occurs solely for economic purposes and does not consider the recipient's context. The Green Revolution in the 1970's-1980's, Redclift (1987) concludes, resulted in a vicious circle of poverty and ecological damage. The Green Revolution that started with the development of high yielding varieties of wheat and rice by the two international research centers, the International Maize and Wheat Improvement Center (CIMMYT) and the International Rice Research Institute (IRRI), can be identified as the representative case of technology transfer. Although it raised output of crops dramatically, serious disadvantages followed. It increased the vulnerability of the environment in the Global South. Redclift notes the disadvantage of this approach as follows:

The new seed varieties were more delicate than those they replaced, less resistant to drought and flood, more vulnerable to plant diseases and infestation by insects. Sustainable increases in yields were impossible without reliable irrigation and heavy doses of nitrogen-based fertilizers (Redclift, p.108).

3.4.2 Livelihood, Recovery of Commons Regime, and Appropriate Solutions

To alleviate ever-deepening ecological and economic injustice, social greens believe that completely different approaches from orthodox theorists should be applied. The strategy for poor countries should not be the transfer of the occidental economic development path, but rather should be some system to guarantee the security of livelihood for indigenous people. Chambers defines livelihood as “the means of gaining a living, including livelihood capabilities, tangible assets. Employment can provide a livelihood but most livelihoods of the poor are based on multiple activities and sources of food, income and security” (1995, p. 174). Chambers says the traditional quantitative measures of well-being such as GDP and income do not reflect sufficiently the realities of people’s living situation. He maintains that livelihood is a better term to capture the complexity and diversity of needy people’s circumstances.

Social greens focus on the recovery of collapsed commons regimes. According to Helfrich and Hass, commons are “certain patterns of relationship between a good or resource and a group of people. They are inherited or collectively developed and passed on over generations; they are initially invented, but have to be nurtured, maintained, protected, and replenished” (2009, p. 5). Commons bear the social relationship, characteristics, knowledge, history, and culture of the society that has formulated them. In this context, the recovery of destroyed commons can be scarcely achieved by technologies created in labs, policies designed by central governments and international agreements apathetic to the individual community’s circumstances. Social greens stress the empowerment of local community and grassroots in the discourse of commons, as Byrne and Glover note:

Policies that empower community-scale decisions regarding ecosystem access and use, that retain community governance of social and economic actions in relation to commons resources, and deny commodity valuation of, particularly, global commons systems, are favored by several in this school (2002, p.19).

They believe that the solutions have to be sought from locals and note shifts happening around the world. Whereas there is little possibility to reach a forcible accord at the international level or the federal level in the case of U.S., various meaningful movements have been springing up from the grassroots. The second-largest GHG emitter, the U.S., is the biggest obstacle to international compromises. However, within the U.S. communities have adopted a completely different perspective than that of the U.S. at international gatherings. A lot of municipal and state governments are aggressively introducing manifold climate change policies that have now started to produce tangible results (Byrne, Kurdgelashvili, & Hughes, 2008). Ironically, international talks to draw out a global agreement often demonstrate bottom-up approaches can be a successful alternative to the deadlocked top-down approach, as Hanley reports the result of the Conference of Parties 16,

Not with “top-down”, legally binding treaties, but with self-assigned targets, bilateral deals to help create low carbon economies, aspirational goals set by G-20summits. If the world business itself with such voluntary activities, this thinking goes, it may all add up to climate protection (Hanley, 12-11-2010).

Along with emphasizing the governance of bottom up, social greens emphasize the establishment of a strong local economy. They are convinced that the robust community-based economy can reduce the severe poverty of people and the negative ecological situation. In contrast to the market liberals and institutionalists’ strategy stressing the globalization of the world economy, social greens think the strengthened globalization and integration of the world economy is the main cause of the globally

spreading poverty. Wealth created by local people, they believe, should circulate in their community as long as possible so that it catalyzes job creation, income increases, and job security in the local communities. For them, local communities should be principle agents of the development plans. The role of central government is establishing institutions and policy programs to support communities to develop self-sufficient economic models. They believe that only development models created in the local community's context can exert their effectiveness and reflect the reality of life surroundings and cultures of the community. As Roseland and Soots note,

This anchoring of locally owned businesses minimizes the incidence of sudden, calamitous, and costly departures, which are often followed by massive unemployment, shrinking poverty values, lower tax revenues, and deep cuts in schools, police and other services ... local purchasing ... resulting in a more efficient, self-reliant, economically resilient community... strong local economies reduce the negative ecological impacts of global trade, in particular fossil fuel emissions from long-distance transport (2006, p.156-157).

For social greens, the development of “appropriate technology” (Schumacher, 1973) that is compatible with the patterns of human living is an important method for recovering autonomy. Technologies designed and developed in circumstances far-removed from those developing world communities where they are to be used have often produced disappointing results when used, and in some circumstances, have worsened social and ecological conditions that they meant to alleviate. Sachs (1993) worries about that the South may pay the same expense as they paid in the process of the previous technology transfer. Also, they show concern that such imposed alien technologies can prevent indigenous people from searching for affordable solutions appropriate to their circumstances which include the level of technology and education in the society, its economic capacity, lifestyle, topographic features, and weather

patterns. Social greens believe that indigenous people have the most abundant knowledge applicable to their circumstances and know what the most appropriate technology is for them. Thus they conclude that ‘appropriate technology’ for a certain society should be generated by the people in that society (Redclift, 1987).

3.5 Implications

Throughout this chapter, I examined the discourses that aim at presenting solutions to modern aberrations such as ecological crisis, poverty, and inequality. The ideas range from those that safeguard the dominant paradigm to those that challenge it. The market liberals group adheres to a belief in the market. The modern market system, which is held to be the most efficient economic structure in humanity’s history, can figure out these problems during the transition period. In their perspective, ecological issues such as climate change, pollution, deforestation, and the loss of biodiversity are fairly new phenomena. Since these problems are new, the market that absorbs cost for them has not appropriately formed and this situation has aggravated modern problems. They believe that the creation of a market system that reflects the externalities from these modern problems is the key to the solution. Furthermore, they have confidence that poverty in the developing world and the ever-deepening inequality both inside countries of need and between the rich and poor countries can be solved with the widespread adaptation of the capitalist market economy (Kuznets, 1955; Rostow, 1959). Also, they believe that humanity’s ingenuity underpinned by science and technology can make our planet “a bottomless well” (Huber & Mills, 2005) for humanity’s convenience. The market liberals’ belief is firmly rooted in the triumphant history of the occidental economic path since the time of the Industrial

Revolution. Also, this faith is underpinned by the super power of the rich Western world in international economic and political agencies.

Bioenvironmentalists and social greens stand against the market liberals' views. Bioenvironmentalists argue that humanity has to acknowledge the limit of planet's capacity that serves us and that we have to seriously look at the adverse effects global industrial capitalism has generated (Daly, 1996b). Social greens fundamentally doubt the power of the market and technology that have moved modern society forward to resolve the contemporary environmental crises. The modern concept of a market that excludes all values except profit and efficiency, they believe, is reinforcing the severity of modern abnormalities. Bioenvironmentalists and social greens commonly call for a change to be made in our belief system, i.e. the core values that guide human thought and action. A founding father of this school, E.F. Schumacher refutes the core idea of orthodox economic ideology that "bigger is better". Also, they put emphasis on acknowledging diverse paths of development fitting to numberless different circumstances and contexts rather than relying solely on the occidental path (Schumacher, 1973). Ellul (1964) and Mumford (2010) showed deep discomfort about humanity's excessive dependence on technology. Technology aggravates problems sometimes or brings forth other annoyances never expected. The ever-growing complexity and compartmentalization of technology deprives humanity of its right to choose the feature and level of technology (Ellul, 1964). Finally humanity comes to be subjugated to technology at the expense of widespread material affluence (Mumford, 2010). This antithesis group to the dominant idea also notes the political economic structure that the capitalist economy has built. They find therein the significant cause of modern problems such as ecological crisis, poverty and inequality

(Byrne, Glover, & Martinez, 2002). Accordingly, the antithesis group believes that the destruction of current paradigm and building a new system is the only solution to the modern crises. They are paradigm destructors as well as dreamers of a new paradigm. However, their voices have only resonated within a narrow swath of popular modern development theory. Even though diverse movements operating in the context of this idea have been under way at the community level and from grassroots organizations for years (Cohen, 2010; Schneider & Martinez-Alier, 2010; Byrne, Kurdgelashvili, 2008; Hughes, 2008; Pearce, 1993), their influence has been meager with real politics in the economic arena. They have been treated as the periphery of SD discourse.

Institutionalists, whose views contrast with the other three groups outlined here, have grown in power in international politics and at economic talks. Institutionalists share most ideas with market liberals although they show a clear difference from them in that they acknowledge the limit of markets as problem solvers and also focuses on the improvement of inequality and poverty. Moreover, they embrace the values of environment and justice in current international politics and economic structures. GG was born in the ideological tradition of the institutionalists and has been argued that it represents a paradigm shift in the development path of the PP. As it is going to be discussed in chapter 6, it holds significantly different attributes which allow it to overcome the limitations of market liberal arguments about modern crises. More importantly, it occupies the official and institutional discourses at the international level as a new paradigm that can open humanity to a sustainable new world. According to the production of ideology for GG and policy recommendations for reform by major international organizations, countries across the world are seeking GG. By putting the power and authority of

political power on SD, or, more accurately, GG, it began to penetrate into people's life and economic practices. At this point, I raise one question—is GG a genuine paradigm shift that can resolve modern crises? The reason why this question is important is that if it is a disguised paradigm shift, humanity will lose resources, efforts, and time reiterating the predominant political economy that has only reinforced inequality and ecological destruction. For this reason, this study focuses on verifying the paradigm shift of GG stemmed from institutionalists.

Chapter 4

CORE CHARACTERISTICS OF THE PREVAILING PROGRESS PARADIGM⁸

This chapter analyzes the multifaceted nature of the PP. Through this process, its five key features are enumerated: the belief that material growth is progress *per se*; the confidence in the progressivism of technological change; the efficacy of a coalition of the government and the market; the belief in humanity's mastery over nature; the reliance on an abundant energy system; and the embrace of a governance structure dominated by experts and bureaucrats. Each characteristic reveals values on which the contemporary world is based and how power structures develop according to these values. These characteristics serve as reference points against which the conformity of GG to the current paradigm is examined. The socio-economic crises that arose from the intensification of five characteristics central to the PP are also described in this chapter. These crises, for which solutions have not been found, have generated many alternative discourses that have sought to develop new paradigms better able to address these problems. This chapter lays the groundwork for the policy level analysis of GG that is conducted for the KGGL.

⁸ The chapter draws heavily from the PhD class "Technology, Environment, and Society" offered by Dr. John Byrne in fall 2010 from the Center for Energy and Environmental Policy at the University of Delaware.

4.1 Belief that Material Growth is Progress *Per Se*

This section describes a major value of the PP: the belief that material growth is progress *per se*. It elucidates how a focus on material growth came to prominence in the PP, and describes some of the doubts critics have raised about using GDP growth as a sole metric of human progress. These doubts are one major factor that has led to the base of the PP being undermined and fostering demands for a new paradigm. The analysis conducted in this section informs the main research question asked in chapter 7, which inquires into whether GG can overcome the PP's core belief that human well-being mainly depends upon material expansion.

4.1.1 Formation of the Belief

The most prominent characteristic of modernity that demarcates it from the previous era is the dominance of the discourse of progress (Marx & Mazlish, 1996). Most academic disciplines and government policies are preoccupied by the progress discourse (Marx & Mazlish, 1996). Some argue that progress is the linear and cumulative process of the modern system (Marx & Mazlish, 1996). Others expect it cannot continue due to the inherent contradiction within modern society (Marx & Mazlish, 1996). There are myriads of theories and policies that serve to promote and sustain the dominant conception of progress as mere economic growth.

To understand the modern phenomenon of the progress discourse, it is useful to break down the meanings that the word progress connotes. Progress semantically involves two meanings: "betterment" and "moving forward." First, "betterment" basically premises the superiority of one thing over others. In the progress discourse of modernity, betterment signifies the pride of the modern age over the pre-modern. In other words, through the word progress, it can be inferred that modern people hold a

belief that the accomplishment of civilization in their age surpasses those of their predecessors. Also, the word progress manifests confidence in the continuity of the improvement of modern society. It is an expression of modern human will to elevate the age's glory. In this sense, progress is a value-laden term extolling the goals of the modern era as intrinsically good (Marx & Mazlish, 1996).

Industrialization is the accomplishment that formulated the pride, confidence, will, and value of modern people. It brought forth unprecedented material expansion and provided an atmosphere that realized countless revolutionary technological innovations. The cornucopian society brought by industrialism is seen as having led to material well-being for people in the most egalitarian way throughout humanity's history. As Byrne and Yun notes; "The cornucopian potential of the new science and economics was seen as paving the way for a democracy of liberty and material happiness" (1999, p.498)

Mass production in industrial society shifted the meaning of production to stand for the pursuit of surplus and the accumulation of material goods beyond those necessary for mere sustenance. The phenomenal transformation of production methods and consumption trends presented people a different level of living conditions from former generations (Ayers, 1944). Emancipation from material misery that had existed throughout humanity's history drove the whole society into an excitement or a future where more production and consumption would continue to escalate. The material affluence, which emancipated humanity from the life of toil and incessant need, established itself as the primary value in society. The belief that material growth secures the prosperity of human society dominated the spirit of modern society. As

Galbraith notes “production remains central to our thoughts... it continues to measure the quality and progress of our civilization” (1998, p. 101).

4.1.2 Beliefs in the Expansive Economy as the Means for Perpetual Progress

Most great economic thinkers had shared the view that continuous material growth is progress *per se*. For example, Karl Marx, the iconic pessimist with regards to capitalism’s prospects, believed that capitalism would ultimately collapse due to the inherent contradiction within the system. Nevertheless, he still believed in material progress and his belief in the centralized mass production system of industrialism was firm (Heilbroner, 1996). In contrast, Alfred Marshall had a faith in the market that is the operating system of capitalism. He believed that markets never fail to find equilibrium and inevitably leads to unending progress (Sandmo, 2011).

With the common belief in material expansion as the avenue for perpetual progress, classical economics was invisible from the ideology underpinning industrialization and has served society by articulating a logic that made mass consumption both rational and inevitable. Adam Smith, the founding father of modern economics, offered a new operating principle to the new economy in which mass production was replacing the old small cottage economy. The concept of economic freedom built by Adam Smith was necessary to the development of the market economy. His vision strongly supported the emerging capitalist economy and became the driving force of unrestricted material progress. Smith (1776) argued that without the organizing discipline of free markets, featuring the ‘invisible hand’ of unintended benefits arising from unfettered markets, there could only be economic chaos in which the cause of progress was at risk.

In theory, economic development and growth should follow a linear path of constant increase according to the early theorists; in practice, economies were marked by cyclic behavior of booms and busts (a feature that intensified as capitalism became more widespread following the Industrial Revolution). Economists were tasked to discover the cause and solution of this economic cycle. Solutions were mainly sought from the consumption side. Heilbroner (1999) explains the cause of economic decline with use of a theory describing the saving and investment cycle. When the prospects of entrepreneurs regarding the future business environment are not positive, for reasons such as inflation, the international situation, and a particular market's gluts, firms' investments decline and the economy moves downward. Keynes thought that the macro economic cycle could be moderated if certain economic players fill the lack of investment. He believed that government had to play that role by influencing aggregate demand through public investment (Sandmo, 2011). Schumpeter also focused on stimulating consumption. In his "Business Cycle Model," the process of creative destruction, in which entrepreneurship constantly destroys the old one and creates a new one, generates new consumption. This process leads to the steady expansion of the economy (Schumpeter, 1939).

Through the efforts to continue progress from generation to generation, the continuously growing production and corresponding demand increases became the very feature of the modern economy. Businesses continuously release revolutionary new products and stimulate consumer's taste. Society puts a lot of energy into provoking the need of consumption with diverse marketing techniques. Governments complement insufficient resources so as to keep enough consumption for economic

growth. In this milieu, overflowing products and heightened consumption trends become the universal element of societal progress as Galbraith pointed out:

The American standard of living becomes the marvel of the world... where increased output satisfies the craving for more elegant automobiles, more exotic food, more erotic clothing, more elaborate entertainment—indeed, for the entire modern range of sensuous, edifying and lethal desires (1998, p.100, 115).

Progress and mass consumption became intertwined as popular expectations, government policies, and corporate strategies. Consumer goods proliferate through the post-WWII era, with an escalation from labor-saving devices to greater consumption of luxury and entertainment goods. For consumers, progress was marked by new products; for governments, progress was measured in indicators of economic growth; and for economists, the measures of increased productivity indicated the success of industrial capitalism.

4.1.3 Rising Doubts about Monism toward Material Progress

In the situation where material progress is considered the prime value of society, the size of progress has been viewed as the yardstick of each country's advancement conveying that country's quality of life, its international economic and political power and its future potential. Gross Domestic Product (GDP) per capita has been the dominant measure of progress. This is the reason why countries across the world have used GDP growth as their most important policy objective (Jackson, 2009). GDP is defined by Daly as "total goods and services produced and exchanged in market during a given period time" (Daly, 1996, p. 2). Briefly speaking, GDP is determined by the total consumption of households along with total government and corporate spending across the country (Jackson, 2009).

However, this way of GDP determination invites a critique about the validity of GDP as a measure of progress. Despite the extent of its use as an indicator of progress, there are limitations with measures of GDP for this purpose. Of many critiques to GDP, the most notable is that it closes its eyes to the costs of material growth. In the world where the logic of GDP overrides, many problematic conditions are generated such as the depletion of fossil fuels, loss of minerals, degradation of forests, depletion of soil nutrients, widespread chemical contamination, species extinction, climate change, and other ominous changes. This “illth”, as opposed to “wealth”, never affects GDP, even though they are critical factors for the quality of life and can ultimately decrease the wealth of earth. Daly sees this attribute of GDP calculation as actively distorting the picture of the health of an economy (Daly, 1996). A full reckoning of the benefits and costs of national economic activity will reveal a different account of the economy than would be shown by GDP that only counts benefits and would therefore provide a more insightful account of the state of national progress.

Another major concern about GDP as the measure of well-being is that it overlooks nonmaterial aspects such as societal cultural characteristics. GDP shows the economic status in only an aggregated and abstracted form. It does not reveal whether each member of society has enough income to live a decent life, how the job security of the society is, whether citizens are well protected from crime, whether wealth is being distributed comparatively equally, whether living ambience is agreeable, or whether citizens feel happiness in their life. In short, GDP is ill equipped to depict social conditions or to provide a measure of social well-being. In the U.S., the most affluent country in the world, inequality among working-age people has risen since

1980, in total by 25% (OECD, 2011a). In 2008, the average income of the top 10% of Americans was 114,000 USD, nearly 15 times higher than that of the bottom 10%, who had an average income of 7,800 USD (OECD, 2011a).

Society's faltering faith in the GDP is compatible with doubt about the modern development path. Dissatisfaction stemming from ever-growing material inequality and ongoing apocalyptic environmental deterioration is scarcely covered with material growth any more. Consequently, there have been many efforts to develop alternative indices that more accurately measure human well-being by incorporating the negative ramifications of economic growth. For example, there is the Index of Sustainable Economic Welfare (ISEW) that seeks to identify the real economic benefits and costs of growth (Daly & Cobb, 1990). It takes into account social environmental costs and the depreciation of natural capital. The Index of Economic Well-being (IEWB) incorporates socioeconomic factors; income distribution, economic security, and the net societal accumulation of productive resources into the measure of progress (Osberg & Sharpe, 2002). The OECD also developed a set of measures consisting of 12 themes; population and migration, macroeconomic trends, economic globalization, prices, energy, labor, science and technology, environment, education, public finance, quality of life, and productivity (Boarini, Johansson, & d'Ercole, 2006). Besides these, there is a diverse group of indices that are being used for various aims; such as the Human Development Index (HDI), the Commitment to Development Index (CDI), the Millennium Development Indicators (MDI), the Well-being of Nations (WoN), and the Sustainable Society Index (SSI). Some of these indices reveal that the pattern of the current economic growth path is not only unsustainable, but it undermines humanity's long-term progress. These alternatives to the dominant gauge of progress

refute growth as the core avenue to humanity's progress and attempt to compensate the failures of the modern economic paradigm.

It cannot be refuted that the material progress brought forth by the modern economic system resulted in the groundbreaking alteration of humanity's quality (and, indeed, quantity) of life. The average life condition of people has been lifted to a level that even the aristocratic classes of old could not enjoy or indeed even imagine.

However, humanity's pursuit of material progress has caused a reversal of ends and means as Mumford points out:

Life was judged by the extent to which it ministered to progress, progress was not judged by the extent to which it ministered to life...money grubbing power acquiring, space-annihilating, thing-producing devices were in fact producing an equivalent expansion and enrichment of life? That question would have been the ultimate heresy (2010, p. 185).

4.2 Confidence in the Progressivism of Technological Change

In the Middle Ages, people believed in the authority of their religion, no matter what. Today, we believe in the authority of our science, no matter what (George Bernhard Shaw).

This section describes the PP's optimism for the problem-solving capabilities of technology and trust in the progressivism of technological change. How technological optimism and a belief in the progressive potential of technological change have transformed society under the PP is discussed in a manner that parallels the latter portion of chapter 7. This section outlines how technological optimism has resulted in a series of uncontrollable and unpredictable outcomes created through the ever-growing complexity of technologies. The threat technological optimism presents to the validity of the PP is examined at the theory level in this section and verified at the policy level in chapter 7 through an analysis of KGGI programs.

4.2.1 Belief in Technology as a Panacea for All Matters of Humanity

The other pillar of modern belief, in addition to material growth, that has supported the PP is its confidence in technology. Technology that developed throughout civilizations flowered in the Industrial Revolution, enabling mass production and material affluence. Technology has been the chief instrument of material progress with its leading emphasis on ever increasing improvement. The discoveries and inventions in science and technology shifted the features of society -- power structure, economy, humanity's everyday life, and even nature -- into a totally different form. Modern society saw a remarkable advance with regard to living conditions, health, transportation, and communication in line with technological progress. After the dire misery of the early industrial society where people, discharged from traditional communes, were packed into crowded ghettos and suffered from toil and low-income, and then highly improved living conditions allowed even manual workers to place their faith in technology. Starting in the era of unprecedented affluence and living conditions in the West, a belief in technology has spread globally. Technology has been considered an inevitable part of the solution for myriads of socio-economic issues. For humanity, technology offered a most trustworthy sanctuary. Technology replaced the role of religion in the traditional society (Huesemann & Huesemann, 2011). It was a savior that promised better life: freedom from toil, boundless leisure, faster travel, instantaneous communication, the absence of sickness and debility, delay of death, and, of course, unlimited material affluence (Huesemann & Huesemann, 2011). In this milieu, technology obtained universal validity as a panacea for matters in every aspect of humanity's affairs. Modern men experimented and adapted technologies that were both practical and imaginary on the basis of trust on technology. With rare exceptions, developed countries have competed

to develop the state of the art technology for extending their economic and political terrain in the world. Invisible wars among countries over innovative technologies were continually intensified. Also, the technology transfer from rich countries to developing countries became a hot issue in the realm of international politics (Gutterman, 1993; Gupta, 1995; Lewis, 2015).

4.2.2 Technological Optimism

Technological optimism has provided a philosophical basis for modern belief in a better future (Huesemann & Huesemann, 2011). Technology utopianism is the initial shape of technological optimism. Technology utopianism, in which technology is believed to be a crucial means for building a perfect world, based its intellectual foundation on Enlightenment. According to Fogg (1975), Francis Bacon (1561-1626), a prime example of an utopian, believed that the practical applications of science and technology were the main ways to ensure the progress of humanity. He saw the potential of technology in that it made humanity able to master nature, accumulate material affluence, and bring about peace. Henri de Saint-Simon (1760-1825) and his student Auguste Comte (1798-1857) positioned science as an ideology that could replace the role of religion. According to Segal (1985), Saint-Simon argued that science would rebuild the collapsed social, cultural, and intellectual unity in the European world through the invasion of commercialism, nationalism, and empiricism that accompanied the advent of industrial society. These thinkers revealed a strong credence for science and technology as solutions to social as well as technological problems. Karl Marx and Engels, apex anti-capitalists, also held strong hope for technology as a principal engine to provide power for social liberation. They thought

that automated technology could free the proletariat weary from a proletariat weary from toils. As Segal writes:

Marks and Engels repeatedly hinted at a society radically superior to the existing capitalist one, which would utilize modern, especially automated, technology as a principal means of freeing the proletariat. The proletariat would be liberated not simply from long-standing alienated labor but also for other, more varied and fulfilling activities (1985, p. 66).

The faith in technology is sturdily persistent. The recent Technological Optimism inherits past Technology Utopianism. Even the pervasion of pessimism about the sustainability of our expansive production and consumption, Technological Optimism firmly trusts in the potential of technology to the remedy to these modern messes. Technological optimists believe that problems engendered by the practical application of technology can be cured with more advanced technologies. Side effects of technology can never stop the growth of technology and material progress (Segal, 1985; Huber & Mills, 2005). Krier and Gillette define Technological Optimism in the following way: “that exponential technological growth allows us to expand resources ahead of exponentially increasing demands” (1985, p. 242). This definition, Krier and Gillette say, is a frontal refutation to the argument presented in *The Limits to Growth* (Meadows et al., 1972). This book points out the physical limitation of the earth system that cannot accommodate the current production system, pollution, and population growth. Thus, it strongly suggests a radical value change encompassing policies and productions systems as well as the mode of everyday life. While the authors of this book stress the limits in terms of physical capacity, Technological Optimists look at the finite from the economic angle and from the view of human knowledge. They argue that limits of resources mean rising costs for the extraction of

natural resources and this can be solved with more advanced technology—either by allowing for more creative extraction or by discovering resource substitutions. In this case, the development of advanced technology depends on investment. These optimists also display a proud faith in human ingenuity. Technology is the outcome of human intellect. For them, there are no limits to human knowledge, therefore, there are no limits to technology. Technology is a human created resource with no finite end and it can tackle the limitations of God-made natural resources. It is the expression of humanity’s ability to manipulate the world within its grasp. As Simon argues, “Resources are only sought and found as they are needed” (cited in Drezyk 1999, p. 59). Taylor adds, “not a single natural resources has ever been created by ‘nature’” (cited in Drezyk, 1999, p. 59). Related to pollution, Lomborg thinks that it can be corrected with proficient application of social and economic resources, as he states, “only when we are sufficiently rich can we afford the luxury of caring about the environment” (cited in Drezyk, 1999, p. 60). Cohen stresses that the strong support of policies can increase the effectiveness of science and technology as the main agent of material progress. This idea is seen when he says, “Given a rational and supportive public, science and technology can provide not only for the twenty-first century but forever” (cited in Drezyk, 1999, p. 61).

4.2.3 Influence of Technology and Innovation Policy

Technological optimism reflects the tenets of the positivist’s intellectual tradition that has overwhelmed modern society. For that reason, technological optimism is ubiquitous. Particularly, the influence of technological optimism is powerful in the policy field. Technology is a key policy area into which each state puts gigantic amounts of resources (Soskice, 1997). At the same time, it has played a role

as a judging criterion that concludes the relevance of other policies. In the capitalist country where it has been an absolute truth that material growth equals progress *per se*, a state becomes a conductor and also a grand designer of economic growth. In this atmosphere, the fate of the ruling power depends on the economic situation of the country and its performance in boosting the economy can take the place of other government malfunctions. Therefore, it is natural for the ruling forces to put a priority on science, technology and innovation policies that develop avenues for new markets and profits. According to Tatum (1995) the atmosphere in the U.S. and elsewhere is favorable for supporting technology regardless of which political party is in power. The National Academy of Sciences argued as follows: “A new Industrial Extension Service should be created at the Department of Commerce to speed technology adoption by US industry” (cited in Tatum, 1995, p. 96).

This trend is also detected at the international level. Of the many international organizations, the OECD, the club of rich capitalist countries, is prominent in efforts for the diffusion of ideas about innovation and technology policies (OECD, 2011b; OECD, 2014d). Germany is a model country that has strongly encouraged research and development with the support of policy incentives provided by continuous institutional reforms (Soskice, 1997; Jacobsson & Lauber, 2006). Japan, South Korea, and Taiwan are countries that utilized government-driven technology innovation strategies for catching-up (Freeman, 1989; Odagiri & Gotto, 1996; Kim & Nelson, 2000; Chang, 2003; Edquist & Hommen, 2009).

4.2.4 Crises Engendered by Technological Progress

A large number of modern philosophers took technology as the gospel truth for progress. However, as phenomenal as were the beneficial outcomes that the progress

of technology brought forth, it was also accompanied by counterblows that were powerful and bitter for humanity. Modern anomalies engendered by technology undermined the belief in science and technology. Violence and mass destruction in the ceaseless wars and terrors are threatening the peaceful life of ordinary people. The 9/11 Attack demonstrated that any everyday life place could be the place of massacre. What was dreadful was that not an arsenal, but a super high-tech means of transportation, was utilized for attacking innocent civilians. Environmental disasters such as the increasing severity of weather events due to climate change, resource depletion, acid rain, the loss of diversity, desertification, etc. are eroding humanity's life base. Continuous miserable nuclear power disasters happen in the most powerful and richest countries; Three Mile Island (the U.S., 1979), Chernobyl (Soviet Union, 1986), and Fukushima (Japan, 2011) took away a prodigious number of people's lives and ruined their life base.

Notwithstanding, the idea that the progress of technology is a decisive factor for national competitiveness and citizens' welfare has been a tenet preoccupying the minds of laypeople, the ruling force, and the expert class in the globalized world. Thus, despite the serious harm engendered by the technology-driven economy, many in society continue to have an unshakable belief in technological progress.

4.3 The Efficacy of a Coalition of Government and Market

This section explores the many ways states and businesses have collaborated with each other in the PP. As the PP sees perpetual growth as a key condition for ensuring political stability, fostering a good business environment has become a national priority in most capitalist countries. This section outlines the consequences of businesses being highly valued by the PP and thus able to exert a great amount of

influence over states. One of the major crises that the coalition of government and businesses has provoked is an escalating system of social inequality, in that businesses became the main beneficiaries of the PP while general citizens were forced to bear the main brunt of the costs. This chapter lays the foundation for the analysis in chapter 8 that examines whether or not GG has deviated from the business-centric aspect of the PP.

4.3.1 Accountability of the State to the Goal of Perpetual Material Growth

Another defining characteristic of modern industrial states is the coalition of government and businesses. Despite fluctuations in the intensity of cooperation, it is a widespread feature of this era. This phenomenon is rooted in the perceived role of the state in this epoch. The obligation of a modern state can be summarized by the following four duties: first, protecting people from violence and invasion; second, securing a material living standard for its citizens; third, maintaining social order by public works and institutions; and last, providing public goods such as social infrastructures (e. g., education) (Hillman & Keim, 1995). Of those accountabilities, the heavy responsibility of the state for a perpetual and stable material progress is unprecedented. The Industrial Revolution brought about a revolutionary transformation in the concept of material sufficiency. As industrialization entered its mature phase, capitalists accumulated phenomenal wealth and general people could enjoy a standard of living that was not allowed for even a handful of ruling class in previous eras. Braudel (1984) vividly depicts this difference in his book *Structures of Everyday Life*. For example, chairs, which are just ordinary home goods in this era, were luxurious and rare home items. The round table, with which King Arthur

overcame the problem of precedence, could be only popular when there were chairs to go with it. Chairs were allowed to only medieval lords.

For the modern state, it became a most important duty to satisfy people's insatiable desire for material progress. This outcome resulted from the combined change in the base of political legitimacy and the potential of society to generate material wealth. Unlike previous eras in which power was authorized by God or royal blood, the legitimacy of modern states originates from the collective agreement of people through political procedures. Thus, there may be few disagreements that the continuation of a nation's governing system depends on the government's ability to meet the material aspirations of society. Especially, the unprecedented material affluence in the developed world led to making it a universal model that the other nations had to follow. The birth of massive middle class families and their remarkable living standard in the Western world and East Asian countries stimulated other parts of the world to follow the Western model. Perpetual material progress became a pivotal requisite for the stability of economic, social, and political structures in a society. Under this circumstance, the alliance between government and businesses for society's material progress is an unavoidable outcome.

4.3.2 Three Types of Government and Business Coalition: the Regulatory State, the Neo-Corporatist State, and the Developmental State

Two bodies share the same economic ends, although their motives are different. States need economic growth for the security of their ruling. Businesses demand government's protection in the fierce competition for dominance of the world market, policy buildings for developing new markets, maintaining sound macro-economic conditions with the mobilization of fiscal and monetary policies, and

research and development investment for frontier technologies. Although businesses need governments to act to the degree that they need a functioning legal system to protect their rights and regulations that mitigate unfair competition, the formation of monopolies, and market failures, they do not want government actions that may alter the market (unless, of course, it is in their favor) and continually say they just want government to leave them alone (Wilson, 2003). People have accepted the support of government for businesses, as long as they sustain and promote the standard of living. It has been believed as a conventional wisdom that the progress of national economy depends on the success of giant corporations that is linked to the well-being of citizens (Riech, 1991).

The degree of cooperation between government and businesses varies and depends upon the type of relationships that exist between the market, economic customs, culture, institutions, and political circumstances in society. Notwithstanding this diversity, the coalition of government and businesses can be classified into three major types, typified as the regulatory state, as seen in the U.S. and U.K., the neo-corporatist state, as seen in Europe, and the developmental state, as seen in East Asia.

Regulatory states focus on rule-makings and monitoring rather than acting as a main agent in the economic and social arenas. States put an emphasis on building mechanisms in which businesses and individuals function in accordance with the most efficient and productive process. Government's interventions are intended to address issues without causing harm to 'individual rights' and/or 'free markets.' However, this structure does not mean that the role of government in the national economy is restricted to constructing the market order. The U.S. Supreme Court and federal and state governments have protected domestic markets and industries with high tariffs

and impeding free trade (Wilson, 2003). Recently, the U.S. mobilized diplomatic power to create a favorable environment on the global market for its businesses (Clinton, 2014). In this system, businesses have secured extensive market freedom as long as they obey market rules constructed by the state. At the same time, they benefit from various actions of their country to maintain international competitiveness.

In contrast, neo-corporatist states are characterized by the collegial alliance between state, businesses, and labor unions. This political economic governance requires the strong and positive role of the state in the arrangement of social and economic structures. It is founded upon the sharing of governance by the state and economic interest groups (Wilson, 2003). In this system, the state plays a role as a mediator between the two main conflicting interest groups -- capital and labor. The origin of this governance lies in the economic and political crises that liberal capitalism brought forth. In the labyrinth of crises encompassed by the Great Depression, mass unemployment, low wages, wars, and the fear of authoritarianism in 20th century, the three dominant interests in capitalist production -- state, labor, and capitalist -- agreed to save the capitalist system through establishing bargaining rights among each other (Schmitter, 1974). European countries with small, democratic, and open economies such as the Netherlands, Sweden, Norway, and Denmark incorporated this governance in their political economy. These countries introduced strong distributional policies to raise welfare benefits for laborers including retirement pensions and improvements in working conditions. In return, unions restricted the wage increase demand at a level that did not harm the international competitiveness of domestic industries. Also, governments became a dependable guardian for large domestic corporations. Governments created various ways for businesses to operate in

the best environment. Examples range from macro-economic policies smoothing business cycles to action programs that reinforce the competitiveness of businesses such as technological innovation and subsidies. This mode shows the balance of power among state, capitalists, and labor; though the inherent motive lies in seeking a system of conflict management and negotiation that can lead to the successful participation in the international economic battle.

Developmental states that appear in East Asia share many common attributes with corporatist states. The conspicuous characteristic of this state is the strong leadership of government in driving economic development. These countries, which are mainly located in East Asia and include participants like Japan, Singapore, South Korea, and Taiwan, started industrialization significantly later than the Western developed countries. As catch-up countries, the governments themselves were the strong driving force for economic development. In this situation where businesses of early-industrialized countries dominated the international market, the strategy these catch-up countries chose was to let the state lead and support businesses with all available national resources and policies. The national plan for economic development is an iconic symbol of the developmental state style of economic and social development. In the case of South Korea, the plan was created on a five-year base. The budget allocation and policies of all governmental departments followed the guideline of the plan. Also, the plan bound the investment and business plans of domestic firms. Businesses were subordinated to the state and bureaucratic elites tightly guided the private sector. Especially, these countries' economy heavily relied on the international market. It made these states push strong export driven policies. In order to boost export, the government bestowed substantial favor to export

corporations at the expense of the domestic consumers' welfare. A policy to intentionally undervalue the currency was enacted to keep the international price competitiveness of their domestic goods. The informational and financial aid from government was crucial for export companies that were fairly retarded in capacity compared to those of developed countries. Subsidies in the forms of financial loans and tariff rebates on export inputs, or generous wastage allowances, privileged the exporters using domestically scarce resources (Chang, 2006). In addition, the selective industrial policy strengthened the coalition between government and business. Selected industries were subject to the special favor and protection of government. Firms in infant industries were under the umbrella of government through tariff protection and diverse non-tariff trade barriers.

4.3.3 Business Advantages over States

Two global economic trends, namely globalization and declining international growth, have altered the relationship between governments and business with a set of conditions that now favor the latter over the former and consequently, wider adoption of regulatory state models. The decline of interventionist economy by internal irrationality exhibited in corruption from 'crony capitalism' in the developmental state and the inefficiency of the corporatist state in economic management, along with the good performance of the U.S. economy in 1990s, led to the victory of the regulatory state in the competition for the standard of international economic governance (Gill, 1995). The free movement of capital, goods, and services under the regimes of GATT and the WTO reinforced the bargaining power of big businesses over states. The large institutional investors and multinational firms that dominate the global economic system control international trade and the financial market (Gill, 1995). Giant

multinational corporations utilize their bargaining power based on the high mobility of capital as a core leverage in negotiations with governments. Governments, whose success highly depends on economic performance, are converging in selecting economic policies that keep the influential multinational corporations in their place of sovereignty. Despite the variation of degree, the trend can be seen in many countries. The most capitalistic and the best example of a country with the regulatory state, the US, is adopting manifold action programs for the protection of domestic companies in the international market. Paradoxically, in the flood of liberalism in the international economy, this tacit, as well as official actions and reactions between states and business, becomes more frequent and intimate than ever before. In the situation where economic growth through mass production is the default value of state and the faith of market freedom is soundly backed by the neo-liberalist economic intellectual circle with organizations such as the IMF, the OECD, World Bank, and the WTO, businesses can easily maintain the VIP customer status of government service. Through the leadership of these international development agencies, there has been a proliferation of bilateral, multilateral, and free trade agreements that have granted firms increased power over governments and opened markets across the globe for MNCs.

4.4 Mastery over Nature

This section describes how the nature-society relationship changed under the PP. The analysis reveals that humanity was able to achieve mastery over nature thorough techniques of governmentality, artificiality, and commodification of nature that developed during this paradigm. The changes in the nature-society relationship

that accompanied the PP have separated humanity from nature and reduced ecosystems to mere resources that are capable of serving human interests, which has led to increased overexploitation and ecological destruction. In addition, human domination of nature has helped corporations to emerge as winners in the PP, as these actors have usually monopolized the means that humans have used to master nature. Whether the tensions that stemmed from human mastery over nature can be relieved in the supposed new paradigm GG will be examined in chapter 9.

4.4.1 The Dualism of Humanity and Nature

The modern industrial society is founded on the ideology of mastery over nature. The relationship between humanity and nature realized a grand transformation in the industrial society. This shift made life-forms in both material and spiritual aspects completely distinguished from how they were seen in the preceding eras. In the pre-modern era, humanity was greatly dependent on nature for its subsistence. The extent of dependence varies from the primitive era to early modern, but the relationship stayed in the realm where nature was the dominant factor over human society for most of humanity's history.

Humanity's developmental history can be seen as the process to overcome the brutality of the environment in humanity's everyday life. Fire, various tools, and technologies have relieved the harshness under the reign of nature. Even though humanity held enough means to reverse the relation before Renaissance, this change did not happen easily. According to Pattberg (2007), the religious dogma in that era operated as a safety valve to control humanity's desire to dominate nature for its material need. He noted that humanity, not as an absolute ruler but as God's royal servant, protected God's creation, nature, against destruction to a certain level.

However, the numerous scientific discoveries, heightening competition of state, conquest of new continents, emergence and growth of the bourgeois class, and emancipation of the human spirit from dogmatic religion that occurred in the modern era, all combined to break broke the valve maintaining nature's dominance.

What made the ideology of the domination of nature penetrate into society was mainly the belief system of people at the time. The belief of nature as a unity, i.e. an organic whole incorporating human society as a part had occupied humanity's mindset. However, manifold events and discoveries resulted in a paradigmatic shift in this perspective of nature. Especially scientific revolutions lead by Newtonian laws that germinated the confidence for humanity to unlock God's secret in the natural world. It generated the idea that humanity could put nature under the reign of humanity on behalf of God (Pattberg, 2007). Science contributed to build the belief that nature was an ordered entity obeying a set of identifiable laws that could be formulated in a mathematical language (Haila, 2000). Humanity was separated from the reign of the organic whole nature. It meant that humanity and nature entered into a new relationship as a subject and object. According to Haila, hereby, nature was located at the confronting side of humanity captured in the metaphor of 'nature out there' and 'nature preceding.' This dualism of humanity and nature has provided the ideology that legitimized the exploitation of nature.

According to Russell (Pattberg, 2007), it was Bacon's achievement to formulate the ideology of mastery over nature. His dictum 'Knowledge is power' shows the essence of dualism that nature is the object of cognition as well as exploitation. This dualistic view of nature is a key element to understand the background of the modern phenomena surrounding the natural environment. For

instance, the Cartesian dualism that underpins human civilization continues to generate a psychological barrier between energy sources and their environmental impact—a barrier that precludes humans from the possibility of ever holistically exploring the interactions of these sectors. It is because societies' views of nature can explain human behavior toward nature (Haila, 2000). Without an ethics of human attitudes toward nature, that ideology connotes a critical risk and allows humanity to operate as a brutal and destructive force against nature.

The belief in dualism accompanied the belief of progress in the industrial society. Modern man had confidence that the progress in ultimate affluence could be achieved by full domination and exploitation of nature. Science and technology, which offered the beginning of this ideology, also played a crucial role as the means to remove natural obstacles to reach the ultimate affluence. Modern Europeans armed with scientific and technological knowledge, military power, and economic institutions bolstering mass production and trade, extended their economic and physical territories beyond Europe. The nature of their colonies across the world was also subordinated to the ideology of subjugation and domination of nature. Thanks to the political and economic power of the modern Europeans, this ideology became hegemonic across the world (although there has been resistance from the colonized world). The great achievements of European economy in material affluence made the European's path a universal model for all countries regardless of different historic, social, political, economic, and natural contexts. The Global North, which held hegemonic power in international politics, took the lead in disseminating this ideology.

4.4.2 Universal Forms of Mastery over Nature: Governmentality, Artificiality, and Commodification of Nature

The human-nature relationship took a completely different direction from the pre-modern era (Pattberg, 2007). Nature lost any meaning as an independent entity. It only had a value when it served humanity's use. It became subject to the exploitation and management by humanity. This relationship was further manifested in three universal forms—what Foucault called 'governmentality', 'artificiality', and 'commodification of nature'—in the modern industrial world (Escobar, 1999).

Governmentality can take place in societies where it is believed that material affluence is the highest mark of progress. In this situation, humanity's reasoning has mainly focused on the instrumental rationality. According to Habermas (1985), the instrumental rationality seeks the most efficient, i.e. cost-effective, avenues to reach a given goal. In this world, fundamental questions about the ultimate end are rarely raised. The interests of knowledge lie in finding and developing potentials for harnessing natural laws and the institutional orders of human society. Under the reign of the instrumental rationality of knowledge, it is the main task of an army of experts to develop the rational forms of management that can be applied to humanity's life and environment. Aspects of humanity's life and surroundings are treated and tuned by the hand of economists, statisticians, political strategists, scientists, and technicians, and the administrative devices of government. Escobar described this feature of governmentality as follows:

Governmentality is a quintessentially modern phenomenon by which increasingly vast domains of daily life are appropriated, processed, and transformed by expert knowledge and the administrative apparatuses of the state. This process has reached the natural order from scientific forestry and plantation agriculture to the managerialism of sustainable development. The ways in which nature has been governmentalized-

made the object of expert knowledge, regularized, simplified and disciplined, managed, planned for, etc (1999, p. 6).

Artificiality is another dominant modern phenomenon that technology, a main driving force of the industrial society, has generated and continues to perpetuate. The modern, human world, which has been repeatedly transformed and reinvented by the accumulated knowledge of science and technology, is completely different from the natural world. Actually, nature disappears under this phenomenon. The natural environment humans experience is actually the artifact of humanity's design and process. Parks and streams in the cities named with 'eco', where humanity is in touch with nature, are actually virtual natures. As Baudrillard points out, "The great signified, the great referent nature, is dead, replaced by environment, which simultaneously designates and designs its death and the restoration of nature as simulation model" (1981, p. 200). The development of biotechnology is altering the genes of flora and fauna. Humanity is a subject matter of technological development to overcome the limitation of life given by God. Human nature enters the terrain of design. For example, the natural world and the climate are changed through application of technologies such as geo-engineering as a result of humanity's economic activity. Ellul viewed that artificiality as an obvious characteristic of the technological society and deplored the outcome that this phenomenon generated. As he wrote,

The world that is being created by the accumulation of technical means is an artificial world and hence radically different from the natural world. It destroys, eliminates, or subordinates the natural world, and does not allow this world to restore itself or even to enter into symbiotic relation with it... so the technical milieu absorbs the natural world (1964, p. 79).

As Ellul argued, the natural and human worlds lose their relationship with each other through the fact that governmentality and artificiality are reinforcing each other. The artificially designed and processed world has to depend its soundness on the humanity's management techniques. Take GMO seeds for example. Their genes are manipulated in the laboratory and so do not have appropriate immune systems for the regular soils because they are not holding inherited information accumulated in the genes of natural seeds which have been communing with nature (Motavalli, Kremer, Fang & Means, 2004). Now, they need to be protected by pesticides and nutrient tonics for their survival. In turn, governmentality stimulates the heightened artificiality to manage the artificialized world in the most efficient way.

The commodification of nature is the most important feature that formed the foundation of the prevailing capitalist economy. According to Marx and Engels (Pejovich, 1972), the history of mastery over nature began with the creation of property rights which prices nature into a tradable form for the marketplace. The property rights assignments over scarce resources stimulated humanity's desire to create surplus beyond what was the requirement for its sustenance. Nature became subordinated to humanity throughout the medium of labor and land use as seen in logging, fishing, hunting, pasturing, etc.; all under the regime of property rights. In capitalism, which purses the accumulation of property rights as the ultimate value, the destructive exploitation of nature went beyond its carrying capacity. The most remarkable feature related to the property rights regime in capitalism is the extensive expansion of property rights into the commons, that space which had been reserved for the open access or communal possession and management throughout humanity's history. Capitalism, which has demonstrated outstanding skills in creating markets,

incorporated natural commons into the market realm. As a result, recent property regimes have included the natural sets perceived as the least privatizable—the atmosphere, oceans, biological entities and process, material and energy cycles—that were traditionally shared and managed by local communities in the list of tradable goods (Glover, 2002). Defenders of the commodification of the commons have advanced rationalizations that such actions were necessary to prevent the over-exploitation that would inevitably occur when access to them was open and that the open commons were being used inefficiently and needed to be brought into the market system as part of the normal process of progress. A myriad of discourses have been developed to back the commodification of commons in the recent decades. Of them, a representative logic that legitimized it was Hardin’s essay “The Tragedy of Commons” (1968). Hardin thought that the tragedy happening in the natural commons came from the free access to the commons. Central to Hardin’s argument was the impossibility of effective cooperative social action for managing a communal resource (and the relative economic inefficiency of any such arrangements occurring outside a free market setting). Hardin argued that solutions designed to ensure that the commons was used sustainably had to be based on humanity’s selfish will or state regulations. That is to say, enclosing commons and establishing property rights on them, he believed, would make humanity efficiently utilize them and adopt creative means to protect them.

Whatever the purpose of the commodification of the commons, what is left to the contemporary world is the disastrous environment expressed in the extinction of biodiversity, desertification, apocalyptic climate change, the destruction of rainforest, and more. Also, the negative influence a social structure based on property rights is

immense and should not be overlooked. Even though surpluses created by the mastery over nature emancipated humanity from nature, it was at the expense of the alienating some populations and creating a ruling class to oversee and distribute scarce resources. Pejovich's statement depicts the shape of the governance generated by the property rights regime and what sustains the power structure of society as follows:

The emergence of property rights creates the possibility of progress, that is the subordination of nature to man, but it also creates hostile social classes. In this alienated environment, the state emerges as a means of preserving the existing property relations and protecting the possessing class against the non-possessing class. Marx was very positive in his belief that the state does not create property relations: its function being to guarantee the existing ones. The existing property relations describe the prevailing social power and from them the passive role of the state is deduced analytically (1972, p. 320).

The three conspicuous features of the modern phenomenon of human mastery over nature—governmentality, artificiality, and the commodification of nature—are intertwined in reality. Governmentality and artificiality perform their roles as beliefs that maintain the social system generated through the commodification of nature. Those three features have heightened and accelerated the separation of humanity from nature. Also, they supported the vested rights of the ruling class in the modern world.

4.5 Embrace of Governance by Experts and Bureaucrats

This section scrutinizes the governing system under the PP, which is monopolized by a minority of experts and bureaucrats. This type of elite governance system, which was established for the purpose of increasing efficiency, has phenomenally improved productivity in the PP; however, in excluding most people from the decision-making, it has also brought about a crisis of democracy. In the end, the governing system of the PP has helped to support the vested interests that already

dominate decision-making or are allied with the dominant decision-makers. Moreover, this expert and bureaucrat-led governing system has intensified the predominant beliefs and power structure of the PP. Chapter 10 examines whether or not GG perpetuates the same governing system as the PP by analyzing how decisions are made in the KGGL.

4.5.1 Crisis of Democracy

This section explores governance systems to understand the key contours as well as the *practice* of governance which drive the inquiry into who governs, what is governed, and how do they govern in order to uncover the logics that underlie the existing governing systems, organizational structures, and socio-technical systems. Through inquiry, the embedded power relations behind key attributes of the PP that are discussed in previous sections manifests: the belief that material growth is progress *per se*, confidence in progressivism of technical change, the efficacy of a coalition of government and market, mastery over nature.

The wellspring of the dominant political system that accompanies the current governance systems in which rights to participate were dominated mostly by men, modern democratic systems are supposed to develop equitable societies by creating opportunities for all people regardless of class, wealth, race, or gender. In addition, while previous governance systems legitimized or justified their course of action through divine blood or a sacred God, the democratic society is intended to derive its legitimacy from the people through universal suffrage. This egalitarian spirit of institutional democracy is embodied in the constitution, in which the constitution forms a basis for the rule of law and the governing system.

Modern democracy achieved significant political and institutional success at the expense of the sacrifice and dedication of numerous freedom fighters. In spite of the progress of institutional and organizational arrangements, the real decision-making power is concentrated within the realm of minor experts in the social environment who stress efficiency and productivity for quantitative progress. Mumford's 'authoritarian-democratic social contract' (1964) is a turn of phrase he uses to capture the predicament of a society that surrenders its freedoms to the goals of efficiency and optimality promoted by the "expert" class. Mumford looks at modern society from the perspective of a Faustian bargain in which people have been driven to hand over their rights to govern their life to experts who promise material affluence and physical comfort.

Mumford's view is underpinned by concerns regarding the autonomy of humanity. In other words, it is a fundamental question about who governs our lifeworld (Habermas, 1985). Mumford's perspective is informed by the understanding that the essence of democracy lies in the autonomy that all living organisms follow a life pattern of their own (Mumford, 1964, p. 1). It is an insightful inquiry in terms of which direction humanity should choose between human-centered and system-centered. The former thrives on the basis of ethics and the primacy of the system lies in the individual humanity. On the contrary, the latter is one-dimensional society (borrowed from *One-Dimensional Man*, Marcuse, 1964). This ambiguity prospers on exploiting the existing gap between the system inputs and outputs. Impersonalization is therefore perceived as the best way to remove corruption and achieve the most equitable result. Discretion is restricted to a minimum because the existing system is defined by two key values, 'optimality' and 'efficiency.'

Industrial society has operated by the system-centered principle and accomplished phenomenal material progress within a very short period of time. Countless towers have been erected high into the sky across the globe as a symbol of economic and technological progress. The number of billionaires being added to Forbes and Bloomberg's super rich list is on the rise annually. At the same time, the discourse on the crisis of democracy is rampant and growing. The pursuit of efficiency and optimality at the exclusion of other considerations in order to maximize output and returns is often accompanied by a decrease in each individual's autonomy. Mumford points out that the rights of modern society are confined to the meta-right to consume with abandon because the goods available in the marketplace are available in different forms at a cheaper value. The material affluence that modern men are enjoying is the reward for abandoning the autonomy of life. This domination lies at the root of all social and environmental problems.

4.5.2 Decision-Making Taken Over by Experts

The decrease of autonomy in lifeworld, is the result of two dominant trends in the governing system of modern world: 'expertocracy' and 'bureaucracy.' The expert systems founded on division of labor have played a role as the main agent of system-centric development. From the time when Adam Smith found that the departmentalization of work was generating tremendous increase of production in a Scottish cottage workshop, the microscopic departmentalization of every realm of society has brought industrial society colossal productivity (Heilbroner, 1999).

Today, departmentalization is ubiquitous, defining every aspect of modern life. Science and technology, which have provided avenues to accrue tremendous wealth, are divided into countless micro fields and each sphere built its own 'silo'

(Vanderburg, 2006). As scientific discoveries are accumulated and technology matures, professional silos multiply by cell division. This phenomenon also occupies contemporary social systems regardless of public, private, or academic field. As a result, modern society is not perceived as an organic whole anymore. The particular belief structure dominating modern society, then, is made up of the perception about simple aggregates of countless subsets. Each part operates by its own optimality principle and the best for each subset results in the best for the whole society. Problems are perceived within part and solutions are sought in the prison of each silo. Complex codes and jargons inside silos block out laypeople from participating in the world of the specialists and experts. In this milieu, the specialists become the main agents who make decisions and control the commodification of knowledge. The social, political, cultural, historical, and individual contexts are omitted or ignored in the decision-making to appropriate to the full resources for the satisfaction of human needs. The result is that system-centered societal order encourages the omission of value-oriented factors. The impersonalization and objectification of subject matters becomes a crucial condition for instrumental rationality in decision-making.

Vanderburg succinctly summarized the modern tendency of expertocracy as follows:

The current intellectual and professional division of labor and the knowledge infrastructure built up with it leads to a technical approach to life, which succeeds brilliantly in terms of improving performance, but does so at the expense of the social and natural orders (2006, p. 173).

Such objectification inflates the importance of the improved performance, minimizes the importance of other elements, and does not allow for a theorizing of the relation of the element and articulation. The use of benefit-cost analysis as a criterion in policy making is an example of the technical approach thus retaining for it a

dominant position in this relation. As a result, implementation of projects to transform society and people's lives are reduced to a simple ratio—the benefit-cost ratio. Moreover, critical decisions are determined by the sizes of inputs and outputs because specialists who adhere to procedures and economic analysis only put more emphasis on measurable and manageable benefits in the basket of outputs. The downside is that other elements and articulations such as diverse circumstances and characteristics of the projects are not considered. Because of resource constraint, a comparison that reduces the utility of projects to a set of numbers is the most facile method and results in least controversial conclusions and technical equality. It may improve performance measured by numerical index, but its policy descriptions rarely touch the roots of diverse social problems since they often operate separate from the reality of concerned subject matters.

In the modern world, humanity has witnessed that various forms of technologies have transformed human society. For instance, rapid growth of communication technologies has brought remarkable convenience and made limitations of geographical distance less of a problem. Yet with those technological advancements, the infringement of privacy has become a source of emerging concern. The networked world shows extreme vulnerability to cyber security. Smart grid technologies bring revolutionary technology, economic, and financial benefits, in particular related to energy system efficiency optimization, but it also give rise to high incidences of cybercrime such as data fraud and denial-of-service attacks leading to increased blowout incidences (Goel, 2015). Nuclear power plants are often targets of terrorist attacks in the multipolarized, conflicting world (Woo & Kwak, 2015). Although human cloning technology is in the path forward conquering God's realm,

people seldom voice their concern to its morality (Macklin, 2015). Today, competitiveness and political power largely depend upon the level of technological progress. Wealthy countries have competed with each other in developing formidable technologies on weapons of mass destruction. In spite of the enormous impact of technology on society, discourses for deciding the type and which form of technology have been left only to specialists and field experts. It is difficult for those who do not directly specialize in a technology to understand it due to the highly specific training, education, and specialized skills this requires. Humanity lives in the institutionally most developed democracy, but people are yielding their rights to decide the essential order of life to a few specialists who are mostly driven by instrumental rationality (Habermas, 1985) and are locked in their silos.

4.5.3 Predominance of Bureaucracy

The predominant institutional governing system that emerged from the expertocracy is bureaucracy. Bureaucracy became the uniform system of government across the world throughout the 20th century (Etzioni-Halevy, 2013). Bureaucratic organizations are characterized by hierarchical order and operations by rules *i.e.* laws and administrative regulations (Weber, 1987). Due to the rule of law, the bureaucratic government has been often considered the democratic and ethical governing system because rules are indifferently applied to all members of society regardless of their social status.

In industrial society, this organized governance system expanded to every part of the country with greater influence on people's everyday life. Governments have taken over all the realms of private and unofficial life world, especially since industrial development overshadowed traditional life organizations such as community, family,

church, and craft and merchant guilds. Governments occupied decision-makings and worked in the principle of impersonality and efficiency. Bureaucratic governments developed into different shapes according to each country's social, political, historical context in recent eras. The U.S. government mainly plays a role as the rule-setter. Private sectors hold significant autonomy in arranging economic structure and addressing social issues. The 'planned economy' of Soviet Union showed an extreme case of bureaucratic authoritarianism (McFarland, Ageyev, & Abalakina, 1993; Levitsky & Way, 2002).

Despite the diverse forms of bureaucratic governments, they possess a common officialism typified by terms like 'red tape' and the 'iron cage of rules' (Weber, 1978), which provide an 'ideological halo' under which bureaucracy finds its legitimacy (Weber, 1978). The ideological halo that brackets diverse contexts of policy fields and circumstances of related customers has undermined the relevance of policies.

Additionally, the dominant flow of communication that typifies a bureaucracy is top-down. In the logistics of top-down, only a modicum of top elites in the hierarchy participates in the decision-making that leads to one-way information flow from top to bottom. It is an inevitable consequence that decisions of top officers separate from realities and aggravate situations, although administration of the policies becomes more scientific and comprehensive with time. Norgaard poignantly illustrates the bureaucratic top-down system in his field study of Brazilian Amazon development, noting that:

They [field managers] are saddled with unrealistic work plans drawn up by bureaucrats or corporate officials who may never have been in the Amazon and understand little about its social and ecological systems (1994, p. 120).

Recent ‘output democracy’ generated by the bureaucratic governing system results in reinforcing vested rights because it is concerned with the performance of governments without questioning the internal policy choices (Peters, 2010). Basically, bureaucracy presupposes that the industrial society is the solution for progress and thus neglects the underlying values and power structure. In the social settings where people are excluded from decision-making on vital life issues, the populace becomes disengaged from fully participating in the society’s welfare and scientifically trained technocrats come to dominate the decision-making process. Such disempowered societies without critical views and rights to decision making only serve to perpetuate the predominant conservative political system. According to Norgaard:

With the populace largely disempowered, progressive institutions eventually came under the influence of those who have economic clout, largely political conservatives with little interest in changing a social structure that had served them well. The agencies are largely staffed by well-intentioned experts, frustrated by the contradictions between the hopes of Auguste Comte and the realities of political power. The dedication of agency staff and political progressive who support them, nonetheless, is framed by the social structure that exists (1994, p. 145).

Consequently, in the current paradigm, experts and bureaucrats dominate every aspect of the governing system. In this governing system, society is divided into small silos and laypeople are mostly excluded from the decision-making process, and experts and bureaucrats play the role of identifying, synthesizing, and prescribing solutions to problems, in principle, through the principle of efficiency. Despite diverse contexts and circumstances of fields, countermeasures for problems are standardized. As a result, vested interests take preeminence, are largely safeguarded, and changes mainly happen in tools rather than in core fundamental systems and structures.

4.6 Characterology of the Modern Paradigm

In previous sections, the five dominant characteristics which shaped the modern world were discussed. A belief that material growth is progress *per se* has acted as the primary belief of modern society. The poverty, disease, and toil which accompanied humanity's existence has been overcome by the wealth industrialism brought and this led to the revolutionary transformation of humanity's life. The value of economic growth has spread beyond the borders of the Western world. Material growth is being pursued as a core and universal value of modern society across the world.

The value system and organizational principles of modern society have been developed to underpin perpetual material expansion. Of them, technological optimism has provided the key foundation for limitless economic growth. Technology has been strongly believed as a panacea for securing humanity's progress and material growth. The belief of technology is deeply rooted in the modern society, and it is even believed that the illth of modern affluent civilization, i.e. the unexpected adverse effects of technology, can only be solved by more advanced technology.

The trust in humanity's ingenuity based on scientific and technological knowledge generated the belief of modernized nature. It is believed that nature can be managed, tuned, and commodified for humanity's convenience by the power of technology. Science and engineering are meant to design a better natural environment. Nature that had been the unity of all creatures, including humanity, became the subject of humanity's utilization. Nature is seen to exist to serve humanity's needs and falls under the realm of humanity's management.

The organizational principles that have maintained the modern system are the state-market coalition and the governance by experts and bureaucrats. The state has

supported the market with a variety of tools including institutions, policy programs, financial aid, and diplomacy. This coalition has been justified by the reason that a stable and growing market guarantees the security of society and the well-being of its people. The strength of this coalition depends on each country's social structure and economic situation but it is becoming a universal goal among countries. In the midst of globalization, corporations are fiercely competing in the world market and states are positioning themselves as the trustworthy supporters for their domestic corporations.

Also, a modern world characterized by high complexity and departmentalization demands a system controlled by experts. Society governed by experts achieved high efficiency and productivity. This governance led to the advent of affluent society, but people had to hand over their autonomy to make decisions regarding the shape of society, their life environment, and their future.

Figure 4.1 illustrates the PP that is characterized with 5 key features.

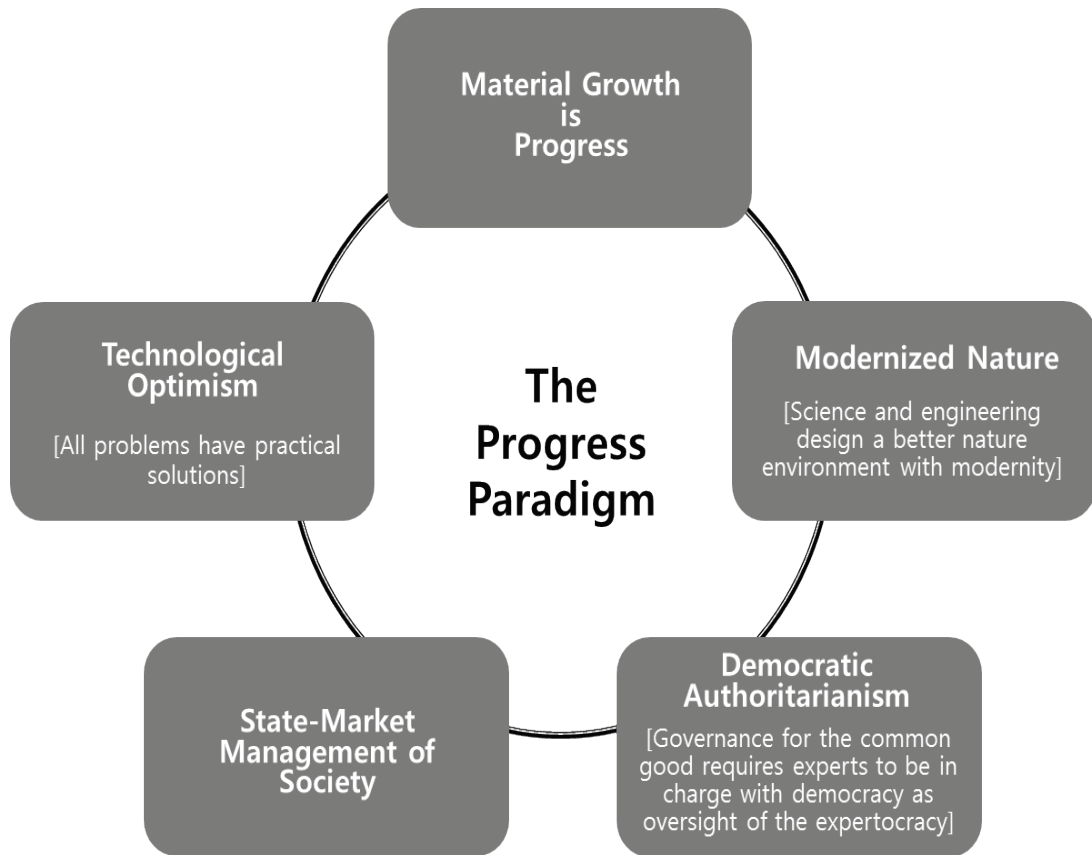


Figure 4.1: The Progress Paradigm.

Five key features have developed the modern world through their interaction with each other. Each characteristic has been reinforced by being mixed with other features. Social phenomena that are portrayed with only one characteristic are not easily found. In the following chapter 5, the energy system will be described as a critical case that represents the modern. The analysis of the modern energy system will show that all five characteristics are melded in a system and the system is the result of the common works of each attribute.

Chapter 5

ABUNDANT ENERGY SYSTEM

In chapter 4, diverse facets of the five key characteristics of the current paradigm were examined. Each element has shaped socio-economic phenomena and systems interacting with other elements. The abundant energy system of modern society is a representative example of how the five key features of the PP interrelate. The illustration of the modern abundant energy system will help to explain how the five characteristics are shaped in the real world and how they affect the life of people and their economic, social, and society-nature relations.

5.1 Embodied Feature of the Ideology “More is Better” in the Energy System

The modern energy system demonstrates that the ideology “more is better” has strongly pushed modern society forward. Specifically, this ideology has been adopted as the framework within which the direction of energy system growth is dictated. Basalla (1979) elucidates the exemplars of the modern abundant energy regime with an equation, as follows:

$$civilization = k(energy)$$

This energy-civilization equation shows that the progress of civilization is compatible with high and growing energy consumption. According to this principle, energy consumption is a vital determinant not only of material comfort, economic growth, and the military power of a state, but of social, moral, and cultural progress. Basalla explains that this belief has its origin in the scientific revolution in 18th and

19th centuries. The transformation from the wide application of the steam engine is proposed as a marked example why this belief became so pervasive. In an age when the steam engine lifted up both the material and educational levels of all social classes, he notes, the moral and esthetic life of even the lowest laborer class aimed at the chance for advancement (Basalla, 1979). This belief has been reinforced in the high-energy society of the 20th century with the energy regime characterized by high quality energy carriers, notably, electricity, gasoline, and natural gas.

Gasoline, a useless byproduct from the refinery process in the extraction of kerosene from crude oil, became a trailblazer for the birth of vehicles with combustion engines. Until the mid-1950s, the US produced most of the world's oil at moderate prices. Oil stimulated the regional economy of places in which it was concentrated like in Texas, the Southwest, and California. Due to the specific application of oil and its inexpensive price, oil consumption spiked. During 1920s alone, oil consumption quintupled in the U.S. (Nye, 1999). The invention of electricity and alternating current made the supply of cheap mega-energy and its long distance transport feasible. Electricity became the basic driver of all sectors encompassing industrial, commercial, and residential. Electricity demand roughly doubled during each decade from 1920 until 1970 (Nye, 1999). New cheap energy sources led the rapid expansion of U.S. production and transformed every aspect of middle class life. Indebted to the high-energy regime, by 1970 the US household real income tripled what it was just after World War II (Nye, 1999). The rising income boosted mass production. Massive consumption of energy-intensive goods increased (Nye, 1999). Americans became complacent and took abundant and cheap energy for granted. Moreover, it became impossible to imagine the social, political, and economic organizations without mega

energy. This phenomenon was not found only in the US. It was universally promoted across the Global North that cheap and abundant energy regime was the cornerstone for expanding the frontier of production and consumption. The unprecedented GDP growth of the developed countries came in parallel with the abundant and cheap energy regime strengthening the belief that high-energy consumption is synonymous with economic progress. As Nye wrote:

The high-energy regime touched every aspect of daily life. It promised a future of miracle fabrics, inexpensive food, larger suburban houses, faster travel, cheaper fuels, climate control, and limitless growth (1999, p. 215).

The belief in the abundant and cheap energy regime shares the common ground with a core modern value that GDP growth is progress *per se*. This is the natural conclusion because the modern material affluence is built on the mega-energy system. In this system material affluence determines moral, cultural, and intellectual achievements of society; an energy crisis has been perceived as identical to the crisis of civilization.

5.2 Complex Energy Technology: A Guardian of Affluent Energy System

In this milieu, the key features of energy policy across the North converged on securing an abundant supply of cheap energy. In effect, cheap and abundant energy from fossil fuels underpinned a broad swath of productive and consumptive activities, with few concerns over the efficiency or wider consequences of these practices. Any complacency over assured energy supply at low prices came to abrupt end for most OECD nations in the 1970s. Middle Eastern oil exports were dramatically disrupted, forcing an urgent reconsideration of national energy policy across the OECD. Following the 1973 Arab oil embargo and the 1979 Iranian Revolution, the initial

response of many oil-exporting countries, including the US, was entirely supply-side focused. Their Immediate policy response was to decide how best to ration limited supplies of oil among the needy and who should stockpile how much to cushion a sudden disruption of future supplies and keep the energy prices cheap. Germany, for instance, placed the overall securing of low-cost energy supplies in the short, medium, and long term at the top of its core energy policies (Hatch, 1986). The U.S., the largest industrialized society in the world, also utilized price regulations extensively on oil and natural gas. Subsidies to the electric utility industry and R&D investments to energy technologies were utilized to secure stable energy supply (Byrne, Matinez, & Ruggero, 2009). When the crises permeated the American high-energy regime in the 1970s, the government chose to promote the cheap and abundant energy regime principally by focusing on developing new energy sources rather than advancing energy conservation strategies. Exceptionally, there was a courageous experiment to resolve the crisis. President Jimmy Carter attempted to transform the American energy regime from prolific consuming to thrift. He tried to deregulate energy prices and let the price approach the world market level. However, his policy direction was terminated by the outrage of citizens at his idea. President Reagan, Carter's successor, went on to win the election with the promise of continuing the perpetual high-energy regime. The statements of two previous Presidents of the U.S. vividly contrast the chosen prevailing energy path and the refused but ought to be chosen energy path.

The energy crisis has not yet overwhelmed us, but it will if we do not act quickly. It is a problem we will not be able to solve in the next few years, and it is likely to get progressively worse through the rest of this century. Our decision will test the character of the American people.... [It] will be the moral equivalent of war (Jimmy Carter, a televised speech in 1977, cited in Nye, 1999).

Those who preside over the worst energy shortage in our history tell us use less, so that we will run out of oil, gasoline, and natural gas a little more slowly.... But conservation is not the sole answer to our energy needs, America must get to work producing more energy. The Republican program for solving economic problems is based on growth and productivity (Ronald Reagan, the acceptance speech at the Republican National Convention of 1980, cited in Nye, 1999).

The impetus that has driven the high-energy regime was the centralized energy system built by diverse technological innovations in the energy field. Since Thomas Edison succeeded with the commercialization of incandescent light bulb and lit up the night of New York with the centralized electric generating system networked by transmission lines, the centralized power system has expanded in size and scale due to a wide range of technical development and institutional changes. The advances in turbine generators and ceramics and metallurgical technologies generated the continuous groundbreaking increase of generating capacities per unit. The generating capacity of the earliest generators was 7.5 kilowatts (kW) that grew to 5,000 kW by 1903, 200,000 kW by 1930, and then to around 1,000 to 1,300 MW by the early 1970s. The improvement of thermal efficiency at the large-scale generation unit realized a phenomenal outcome. Concomitant with the progress of production efficiency, the remarkable increase in the carrying capacity of the transmission system, which rose from less than 50 kV in 1900 to almost 765 kV in recent time, almost completes the necessary technical conditions for the centralized power system. These technical conditions make it possible to achieve an effective economy of scale in power generation. Savings from the construction of large-scale units became available and the periods in which the marginal costs of power production continued to decrease were extended. Multiple units on a single site came to represent the mainstream of power generation. The site did not need to be near load centers. In the case of nuclear

energy that requires large-scale generating capacity, fuel cycle facilities, radioactive waste storage, etc. in the cycle of power generation, centralization was more advantageous both in the aspect of technical design and the public relations associated with safety and environmental issues (Messing, 1979). At this phase, it was considered as natural that electricity flew interstate through transmission lines networked like cobwebs. Government policy played a critical role in regulating the industry (which was a mix of public and private enterprises), with recognition that electricity supply is a natural monopoly, a feature that fosters centralization of generation within defined markets

The perpetual increase of energy demand and large-scale power generation facilities stimulated the centralization trend of energy system. The accelerator of this trend was nuclear power in mainly developed industrial countries. After World War II, the U.S. spurred technology development for the application of atomic technology to power generation. Despite accolades for this new energy source in securing the perpetual high-energy regime, nuclear power was slow to claim a large market share of retail electricity because core energy sources were too cheap to give way to the new energy. The oil shocks in the 1970s created a turning point in the commercial prevalence of nuclear power. Threats to the abundant energy supply by the international geopolitics utilizing oil encouraged giant energy consumer states to search for a new energy source that could satisfy three conditions: abundant, cheap, and independent from imported sources. Nuclear power gained popularity by being regarded as a tailored energy source for the desperate situation. In the 1970s, nuclear reactors increased from 15 to 74 in the US. In 1980, electricity supplied by nuclear reactors amounted to 265 billion kilowatts, accounting for 10 per cent of all the

electricity used in the U.S. During the 1980s nuclear power doubled. The largest portion of government energy R&D was allocated to nuclear technologies. In the 1980s roughly 70 percent of the Department of Energy was appropriated to nuclear programs, with 40 percent devoted to military applications (Byrne & Rich, 1986). As of the summer of 2009 the generation capacities of the biggest 20 nuclear power complexes range from a top of 3,942 MW to a bottom of 2,069 MW. Average capacity was 2,476 MW. The top 20 reactor's average generation capacity reached 1,224 MW. Germany also chose nuclear energy and natural gas to reduce the share of oil to 44 percent of total energy consumption by 1985. According to the energy program for the Federal Republic published in October 1974, the installation of 45,000 or possibly 50,000 MW capacities by 1985 was expected to be necessary to reduce dependence on imported oil and this would be around 40 percent of total electricity supply (Hatch, 1986).

Renewable energy has emerged as a promising response to global warming, gaining the position of a core policy agenda followed by institutional arrangement, government R&D, and private sector capital formation. As a result, the renewable energy regime followed the same development path as its fossil fuel rivals. Many renewable energy production facilities are concentrated in remote areas of resource abundance like the desert solar farms or massive wind farms in the American Midwest. Electricity produced from those gigantic renewable power generation sites is delivered to load centers through high voltage transmission lines; i.e., they are connected to the national and sub-national distribution grids. Complex technology is believed to play a key role to help make renewable resources meet the ever-growing energy demand and the cheap price of the traditional power sources. Byrne et al.

explain that large-scale renewable energy complexes have inherited the role of modern mega-energy system serving modern mass production and consumption economy, noting:

Rather than questioning the underlying premise of modern society to produce and consume without constraint, contemporary green energy advocates warmly embrace certain bigger and more complex machines to spur and sate an endlessly increasing world energy demand (2009, p. 87).

The ideology of “more is better” has been effective even in the time when nuclear power accidents have destroyed innocent people’s livelihoods and even in the time of ever-worsening density of continually increasing GHG emissions resulting from the combustion of fossil fuels. Abundant warnings about energy resource depletion have not discouraged the desire of society from pursuing material comforts brought by energy affluence. This incessant aspiration of affluent energy is founded on a confidence in human ingenuity that has been formed by successful events in technological innovation. The difficulties that society faces in the march towards eternal material progress, it is believed, can be overcome by more advanced and complex technology.

5.3 Abundant Energy system Supported by State-Market Coalition

The energy system that has been the driving engine of modern industrial society is a sector where state-market coalition has been strong. There has been a remarkable uniformity worldwide in state energy policy and in the face of differing national economic, geographic, and institutional circumstances, many commonalities in the relationships between states and energy markets. Citations needed. I’d use some

of the OECD reviews of energy policy. The deregulation of the electricity industry in the 1990s was widespread across the world (Griffin & Puller, 2009).

The target of the deregulation was presented as price cuts through competition, more choices, and related technological innovation to meet future electricity demand with scarce exception like the Norwegian reform⁹. The embedded goal was mainly to create economic opportunities such as improving industrial competitiveness and boosting economies (Woo, Lloyd, & Tishler, 2003). While electricity had been perceived as the right of life, deregulation transformed electricity to commodity (Byrne et al., 2009). By applying differentiated pricing policy by sector, each group came to have a different rate according to its bargaining power in the market or the policy direction. The residential sector has been charged with the highest rate (Jeon, 2013). Despite its low demand elasticity, the inverted block rate applied to the residential market progressively lifts bills as consumption moves to higher consumption segments.

The separation of the electricity business model into generation, transmission, distribution, and retail created the market environment in which the residential sector has weak bargaining power. Compared to large commercial and industrial users that can have diverse options to lower utility bill by reducing the steps of consumption cycle, for example, and can write contracts to purchase electricity at the transmission phase, the residential customer has few options but accept the utility's rate charge. In addition, the large commercial and industrial users are charged according to the time-of-use (TOU) rate that divides a day into three pricing time zones: peak, mid-peak,

⁹ The Norwegian reform was conducted in the name of environmental policy targeting electricity price raise and capacity expansion discouragement.

and off-peak, and so they can reduce their bills with the optimal strategy of making production runs during off-peak times. Moreover, the industrial and commercial sectors have lower rates structurally than the residential sector and these rates are justified by claiming they protect the international competitiveness of domestic industries. As a result, in many cases, the slowing of electricity demand increases has been greater in the residential sector than other sectors. For example, as of November 2014, the average retail price of electricity exhibits big differences by sector in the U.S.: Residential 12.46 USD/kW-h, Commercial 10.55 USD/kW-h, Industrial 6.67 USD/kW-h, and Transportation 10.40 USD/kW-h (*Source: http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a*).

These changes have two important equity implications. Firstly, in modern society, electricity is a basic necessity. By making this necessity a commodity subject to business, regular household consumers came to pay social costs that help businesses increase their wealth. Further, these consumers are effectively beholden to government-sanctioned suppliers and have highly constrained opportunities to influence prices. Secondly, these changes brought about a shift in the responsibility to save energy from the suppliers to householders who individually have comparatively fewer resources and opportunities to reduce their electricity consumption, and by implication, less influence on the negative social and environmental consequences of the electricity system. In the following section, some of these implications for consumer sovereignty and democratic rights are considered.

5.4 Engendered Undemocratic Socio-Economic Feature

Ironically, the modern energy system, which made abundant and cheap energy available without class and spatial limits, has engendered undemocratic socio-

economic features. In the 20th century, the high-energy system presented more comfortable life to people though it did not always translate to better life for everybody. According to Nye (1999), American farming underwent a transformation from family businesses to big business by using high energy-consuming equipment, hybrid seeds, intensive fertilization, and pesticides. Farmers gained better crops, better animals, and better houses, but it was accompanied by bigger debts and more worries. In the 1970s, bankruptcy and poverty were observed more often in rural areas than in urban centers. As machines undertook fieldwork, society came to change to the white-collar world. However, for most minorities, particularly African-Americans and economically disadvantaged whites, a great degree of exclusion from this change was apparent since they could not afford the right education to enable them to access white-collar opportunities. They were denied access to material affluence and energy abundance.

The centralized large-scale energy system also aroused equity challenges between load centers and facilities sites, notably the power generation and high voltage transmission lines. Even though only meager amounts of power generated from the power plant are consumed within their proximity, and the community feels concomitant troubles from power production and transmission where generation facilities are located. Nowhere is this more evident than the locations of power station accidents. For example, communities living adjacent to the Three Mile Island nuclear power station were those most affected by its aftermath. A statistical analysis conducted by the Radiation and Public Health Project found that mortality rates had greatly risen for infants, children, and elderly residents in the first two years after the Three Mile Island accident (<http://pittsburgh.about.com/cs/history/a/tmi.htm>). The

nuclear waste disposal site sealed the neighboring area for 100,000 years leaving it as barren land.

Conflicts over construction of high voltage transmission lines became widespread anywhere the centralized large-scale power plant was distant from load centers. The concerns included land-use conflicts, noise created by lines, aesthetic anxiety, the fear of health, and safety threats (Furby, Slovic, Fischhoff, & Gregory, 1988). In a fair number of cases, projects become subject to enormous costs and long delays. Also, they often result in severe social disruptions between communities neighboring construction sites and load centers. A prominent equity issue is that those least responsible for the power demand have to bear the social, environmental, and economic costs engendered by the high-energy regime.

As to be expected from a universal technology, the range of social and environmental issues experienced in developed nations from the introduction and growth of large and centralized electricity systems also occurred when introduced in developing countries, albeit with a magnification of some problems due to local circumstances (Barns & Floor, 1996; Barnes, 2007). Conventionally, the introduction of modern energy systems is an essential and integral component to economic development in developing countries, yet some critics find that it has the opposite effect. The electricity system architecture and infrastructure favors the urban locations where it is located and accordingly promotes wealth formation among existing elites, especially those with interests in industries linked to electricity generation and consumption. Rural areas alienated from the national development strategy cannot have the minimum electricity service for their small store, lighting at night, storage for

food and medicine, and operating surgery rooms. Energy disparity in the developing countries is directly connected to social inequity (Barnes & Floor, 1996).

5.5 Shared Crises of the Current Energy System and the PP

Modern affluent society is founded on the abundant and cheap energy system. All core characteristics of the modern paradigm have intervened to continue the abundant energy system. Figure 5.1 visualizes the features of the current energy system in which all core characteristics of the PP are embedded.

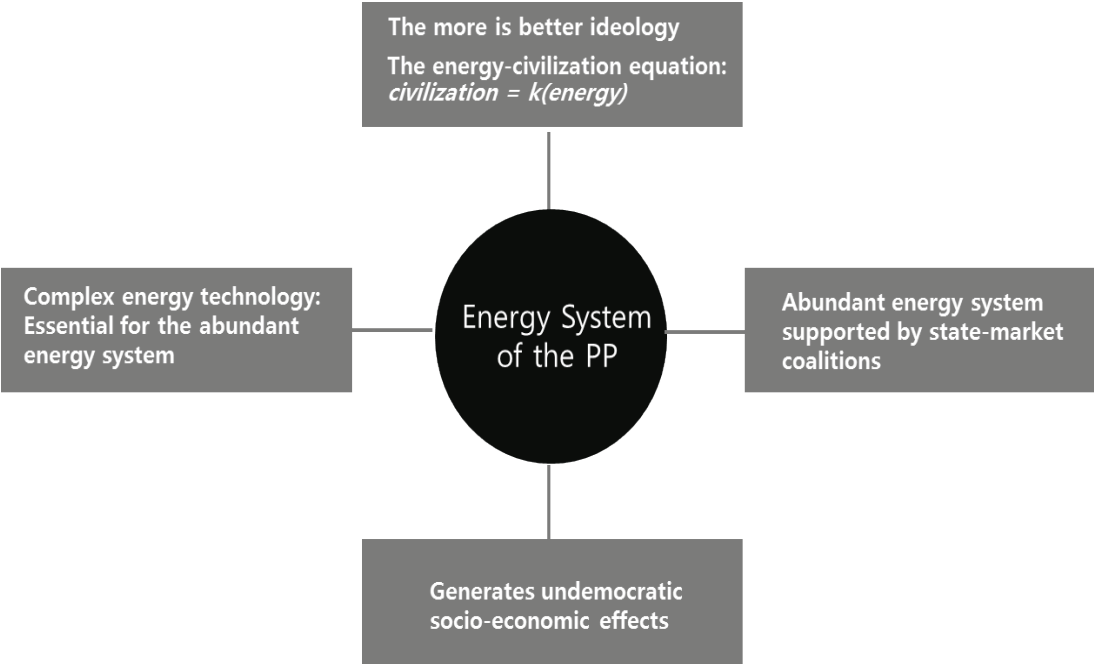


Figure 5.1: Energy System of the PP

Technology is the key avenue through which energy production supported the ever-growing economic scale and consumption. Optimism that humanity can continue

the present economic progress and material affluence despite diverse social tragedies and resource depletion stemmed from the mode of current energy usage which is deeply rooted in a belief in technology. Energy technology has provided temporary relief to the problems begotten by the abundant energy system, but the intensified artificiality of nature from the application of complicated energy technologies is reinforcing the potential of risk to society.

Institutionally, the abundant energy system has been bolstered by the state-market coalition. Diverse energy policies introduced in the modern society have targeted the stable supply of cheap energy that is a key element of production. The state-market coalition system brought about injustice between energy users, and was especially unfavorable to general public. This outcome resulted from the occupancy of the decision-making processes by minor energy technology experts and economic and bureaucratic elites. As a result, undemocratic features generated by the democratic authoritarian governance in the energy system are ubiquitous.

The modern energy system has clearly contributed to improvements of humanity's quality of life but accompanying anomalies have been manifest. Energy demand is still exponentially increasing. Burning fuels to maintain modern man's profligate life style has driven civilization close to the edge. Modern civilization is standing at the threshold of keeping the current high-energy path and dialectically amending the malfunction of it or turning to the road not taken as Amory Lovins (1976) already proposed in the 1970s. The transformation of the energy system will become the symbolic sign of a paradigm shift.

Chapter 6

THE CASE FOR GREEN GROWTH AS A PARADIGM SHIFT MADE BY ITS PROPONENTS

Anomalies that can be classified under the three general categories of ecological destruction, ever-growing social inequality, and continuous economic crisis have combined to form the main crisis of the modern PP. This crisis has arisen out of the PP's failure to produce effective solutions for these anomalies. The complexity of the crisis, which has resulted from the mutually reinforcing nature of these intertwined anomalies, has undermined the foundational values of the PP and stimulated demand for a new paradigm. GG is one of the new paradigm candidates that grew in popularity following the 2007-2008 global financial crisis.

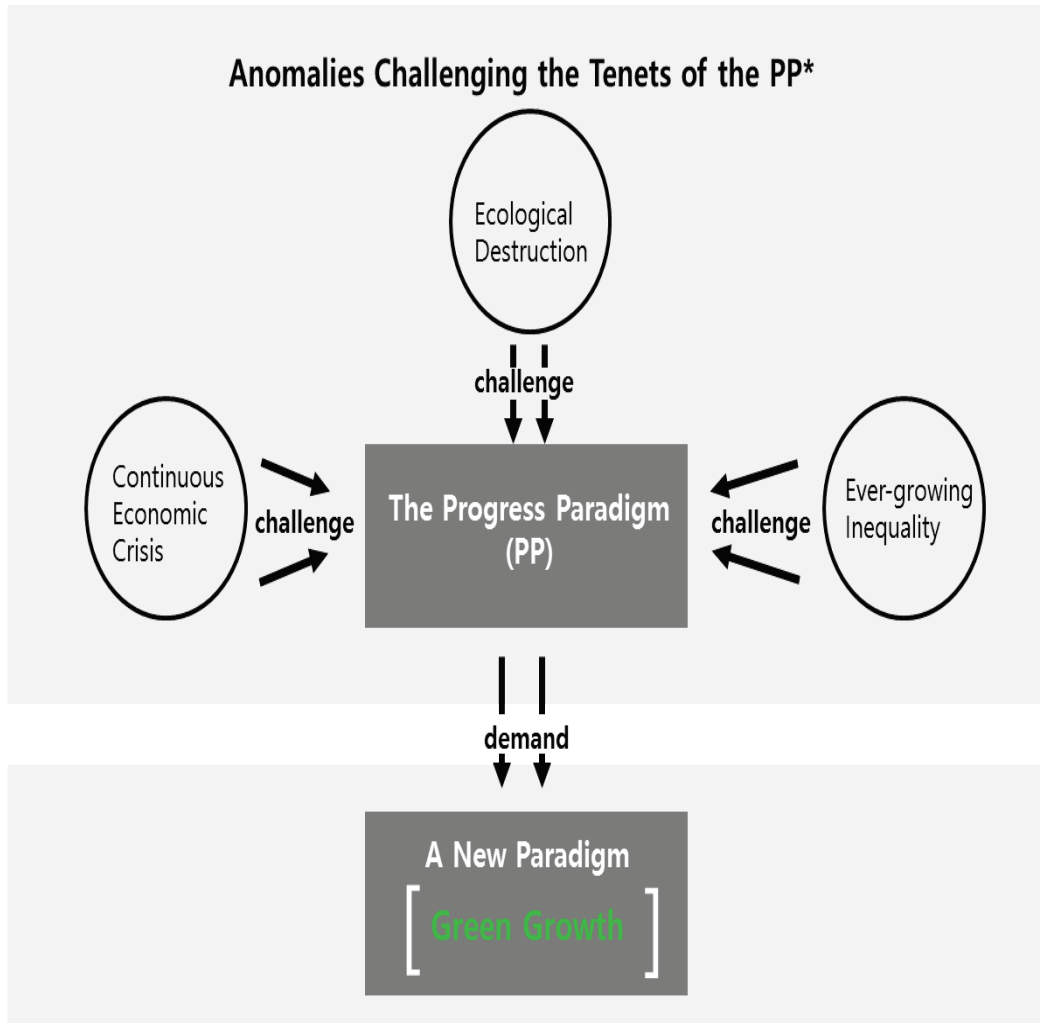


Figure 6.1: Anomalies Challenging the Tenets of PP and the Emergence of GG

Not long ago, the term “Green Growth” was used only in reference to the growth of the environmental industry (Ernst & Young, 2006; EU Commission, 2009). Recently, however, use of the concept has expanded remarkably, as evidenced in international agency publications, to reference a myriad of other topics, including the quality of economic growth, modes of production, and holistic institutional changes required to support a new, more environmentally conscious mode of economic growth

(Barbier, 2010; OECD, 2011c; UNEP, 2011). It has also become common for GG strategies to include a discussion of social issues such as inequality and poverty (UNEP 2011).

The replacement of conventional capitalist growth with GG has been labeled a paradigm shift by its proponents due to three main factors associated with this strategy. First, GG aims to modify the capitalism's focus on unlimited economic growth to a bounded growth that takes other values into consideration. Second, GG endeavors to overcome the widespread perception that environmental protection is incompatible with economic growth. GG has its roots in SD. SD emerged during the beginning of the second half of the 20th century and became institutionalized in international politics in the late 80s and early 90s at the urging of the UN. Accordingly, diverse actual SD policies have been embraced at the sub-national level.

This chapter outlines the origins and aims of GG, which has emerged as a paradigm shift that has been argued by its proponents promising not only to save the planet but also to secure the perpetual progress of humanity.

6.1 Evolution of Green Growth

6.1.1 The Origin: Sustainable Development

The origins of GG can be found in various concepts developed under the heading of SD. Jacobs describes GG as “a child of sustainable development” (2012, p. 7), and the SD discourse itself arose out of reflections on the capitalist economy and the magnitude of ill effects it was generating along with material affluence. Numerous SD theories and policies have been proposed by many prominent international organizations, such as the UNEP (United Nations Environment Programme), the

UNESCAP (United Nations Economics and Social Commission for Asia and the Pacific), the OECD (Organization for Economic Cooperation and Development), and World Bank, and also articulated by economists from several disciplinary sub-fields including Buddhist economics, environmental economics, ecological economics, steady-state economics, and green economics. In accordance with these international trends, countries have also created SD policies at the national and sub-national levels. Notwithstanding the diversity of thought that characterizes the SD discourse, the main strategies that fall under this label can be divided into two basic types. The first is in line with the mainstream idea that economic growth is essential for securing human progress, and assumes that the failures of the capitalist system can be resolved using technical and practical solutions. In other words, this type of SD is founded upon the idea that human society has to reconcile economic growth with environmental protection in order to ensure continued progress. In contrast, the second dictates that the belief system deeply rooted in modern society must change before any true progress can occur. SD strategies of this second type are fundamentally antithetical to the orthodox economic system. For example, the ecological economist Daly raises the question of whether the economy can continue to grow without collapsing the planet. As described above, he argues that as the ecosystem has already surpassed its capacity to sustain the level of affluence the capitalist economy has achieved on a global scale, humanity must cease to pursue unlimited economic growth and be satisfied with a steady-state (zero growth) economy. Another prominent ecological economist, Norgaard (2006), argues that achieving SD requires reforming the relationship between human societies and nature, as environmental conflicts will not be resolved if human domination over nature continues. Believing that human-nature conflict has

accelerated the overuse and exploitation of ecosystems, Norgaard's theory of co-evolution implies that all living creatures must find a way to coexist harmoniously on Earth. Other thinkers, such as Byrne and Glover (2002), consider SD to be a potential means of resolving tensions and malfunctions within the capitalist political economy. According to Byrne and Glover, the capitalist political economic structure is to blame for the deterioration of ecosystems as well as the degradation of human communities who depend on them for sustenance. As a result, they believe that SD should be pursued from a political ecology perspective.

Among the various perspectives on SD, the inspiration for Green Growth originates from the type of SD proposed in the 1987 "Our Common Future" report presented by the World Commission on Environment and Development (WCED). This report, which now forms the basis of the mainstream SD discourse, helped to popularize the concept of SD as an international political agenda. Specifically, the WCED articulates the need to

Make development sustainable-to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. ... Meeting essential needs requires not only a new era of economic growth for nations in which the majority are poor, but an assurance that those poor get their fair share of the resources required to sustain that growth. Such equity would be aided by political systems that secure effective citizen participation in decision-making and by greater democracy in international decision-making (1987, p. 13).

The WCED report's conceptualization of SD specifically includes environmental, social, and institutional factors. The environmental factor refers to SD's emphasis on protecting ecosystems over the long-term; the social factor to reinforcing social cohesion and justice among people, countries, genders, social groups, and generations; and the institutional factor to securing fair participation in the

international decision-making process to minimize conflicts between rich and poor countries (Spangenberg, 2004). The report also underlines the key role technology and international governance must play in achieving SD. The WCED suggests that developing countries and developed countries should each target an economic growth rate of 5-6% and 3-4% respectively to ensure distributional equity over the next 30 years. In short, the definition of SD presented in “Our Common Future” consists of an economic growth strategy that also aims to uphold certain environmental and social values. As Spangenberg notes,

Based on expected technical improvements (eco-efficiency), this growth was considered to be under control regarding its environmental impacts, making ‘Green Growth’ a no-regrets strategy (2004, p.81).

The SD concept established in the “Our Common Future” report in the late 1980s was later expanded at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro and again reinforced at the 2002 World Summit on SD in Johannesburg. Prior to the 1992 Earth Summit, SD had remained merely as an abstract ideal guiding international politics, but Rio saw the creation of specific SD action plans and policies. The Johannesburg summit took the realization of the ideal a step further by recommending that nations develop their own strategies for SD to be implemented by 2005 (UNESCAP, 2006).

6.1.2 Ecological Modernization

Ecological modernization (EM) stems from the mainstream theory of SD that seeks to achieve continuous economic growth to better human well-being while also protecting the environment. Strictly speaking, EM is an actualized version of SD pursued by the countries of the rich developed world, which already have amassed a large stockpile of technology, funds, and administrative assets to incorporate this type

of innovation into their development policies. The main difference between SD and EM is that EM aims to provide innovative strategies and detailed action plans for achieving SD-inspired ecologically sound growth. In this context, Jänicke describes EM as “a technology-based and innovation-oriented approach to environmental policy” (2008, p. 557).

After EM was invented in Germany in the early 1980s to integrate economic progress and ecological protection, the strategy has been conceived and realized in other developed countries, including the Netherlands, Sweden, Norway, and Japan. According to an analysis by Jänicke (2005), countries that have undertaken EM reforms share a similar political economic structure in which the state has had a history of actively intervening in the economy to address the tensions and crises generated by the capitalist system. Moreover, the European countries that have adopted EM policies have all shared a tradition of corporatism, which has enabled these governments to lead “a coalition for ecological modernization” (Jänicke, 2005, p. 136) with the support of businesses and the public. Japan¹⁰ has also developed EM policies similar to the government-led reforms that have taken place in Europe.

EM is characterized by a strong faith in the ability of technology to solve capitalism’s crises. Specifically, this strategy proposes that preventing pollution will secure the sustainability of the capitalist economy while new technologies open markets for businesses. Proceeding from the assumption that green technology pays in

¹⁰ According to Jänicke (2005), the Japanese government formed a strong coalition with business to pursue ecological modernization in the 1970s. Through the coalition, Japan achieved substantial gains in renewable energy and energy efficiency, as well as eco-restructuring. Reforms ceased as the coalition deteriorated in the 1980s.

two ways (Huber, 2008), it is common for countries that adopt EM policies to invest heavily in R&D (Jänicke & Jacob, 2005). It has usually been the case that government takes the lead in developing advanced green technologies, as it is thought that businesses, accustomed to seeking quick profits, would hesitate to make the long-term and visionary investments necessary for these reforms to be successful. Numerous policy programs, subsidies, and tax benefits have also been introduced alongside these R&D measures to encourage green innovation and the technological development of businesses (Jänicke, 2008). As the cooperation and compliance of citizens is also critical for government-driven EM to take hold, diverse incentive programs and policies intended to attract citizen support for greener lifestyles and consumption modes are likewise introduced (Jänicke, 2005).

But while it has been the case that EM has created many economic benefits and some degree of environmental improvement in countries that have initiated these reforms, pursuing SD in this way, i.e., by means of technological innovation, is simply not possible for most countries and remains a feasible strategy only for an elite few. The difficulty associated with embracing EM as a way forward lies mainly in the basic conditions required for these reforms to succeed. The first requirement is a political economic atmosphere that can justify the intervention of government into the market. This alone can be a large barrier for the English-speaking portion of the developed world, which historically has believed that government intervention in the economy should be kept to a minimum so as not to interfere with the regulatory power of the market's invisible hand. A second necessary condition is a large supply of economic resources, given that a significant amount of government and private investment is a prerequisite for restructuring industries, business practices, and modes of production

and consumption. Thirdly, these reforms require the strong leadership of an elite group, which typically consists of government bureaucrats, scientists, reform-oriented environmentalists, and businesses (Dryzek, 2013). In most developing countries, fostering a functional system of cooperative governance between this group of experts is usually unrealistic to expect. The difficulties associated with accumulating sufficient knowledge for technological innovation present a fourth major barrier for EM. Last and not least, there are substantial doubts as to whether all countries believe that these economic reforms are necessary. Despite the persistence of voices in the international political arena calling into question the sustainability of the traditional capitalist economy, most countries do not place a high national priority on sustainability. Developed countries have not taken responsibility for the ecological deterioration brought about by their economic growth, nor have they expressed urgent support for greener markets. Developing countries have hastened to develop their own economies while disregarding the destructive impacts this has brought to their ecosystems, including those that directly impact the livelihoods of their citizens.

6.1.3 Emergence of Green Growth

Amidst the aftermath of the 2007-2008 Global Financial Crisis and possibility of a strict post-Kyoto climate regime, the EM strategy of GG emerged as a promising solution for a planet facing the twin threats of environmental apocalypse and perpetual economic stagnation. Considering the longstanding fears that SD would reverse the 200 years of progress brought about by the Industrial Revolution (Redclift, 1987), the proposal to consider ecological protection along with economic progress marked a great reversal of opinions. Countries that envisioned new possibilities for economic and ecological progress in the alternative strategy of GG began to voice their support

for this approach on the international stage. Germany, the Netherlands, Sweden, Denmark, and other nations that had already pursued a path of EM led the international talks and became the role models for countries seeking a new path of economic development through GG.

Multiple factors accounted for GG being embraced internationally at this time. One was a gaining recognition that continuing the global “Brown Economy” into the future would eventually bring about the destruction of nature on which human society depends. An even more pragmatic motivator was the pressure of international climate talks and anticipation that environmentally hazardous economic activities would soon be subject to international regulation. In addition, there was an expectation that a decisive economic transition to GG could reinvigorate stagnant economies and create greater opportunities for increased national wealth, jobs, and income. This last point was particularly emphasized in the reports of international organizations, including the OECD, which noted, “We need to rely on new sources of growth. There is no easy answer, but there are two clear opportunities that we can harness: innovation and Green Growth” (2010, p. 7).

However, despite these broad factors that helped GG rise to the top of international agendas, the circumstances that led individual nations to seriously consider adopting GG differed significantly from country to country. Specifically, the motivations for pursuing GG were markedly different in the Global North than in the Global South. Industrialized countries in the North were facing strong international pressure to address climate change and ecological degradation. According to Rockström et al. (2009, cited in OECD 2011c), the Earth had exceeded its ability to sustain five key eco-system processes out of eight, as the result of climate change,

biodiversity loss, ocean acidification, interference in the nitrogen cycle, and stratospheric ozone depletion. By the late 1980s, the atmospheric concentration of CO₂ had surpassed 350 parts per million (ppm) and rose to over 385 ppm in 2010 before reaching the level of 403.70 ppm as of May 2015 (source: www.co2now.org). Additional evidence of the planet exceeding its natural capacity rekindled demands that the developed world take appropriate action in the face of what appears to be an impending ecological apocalypse.

Meanwhile, the developed world had been seeking a solution to its persistent economic crises. The litany of crises facing the contemporary global economy, including the housing crisis, the financial crisis, and the debt crisis suggested that every sector of the economy could shortly find itself in danger of collapse. Since the time of Keynes, most prescriptions for economic crises typically fall somewhere along the spectrum between Keynesian and Liberalist solutions, and the recent history of economic policy has fluctuated back and forth between these two measures. However, following the 2008 financial crisis, it has become clear that conventional prescriptions, whether Keynesian or Liberalist, have not been very effective in resolving present economic calamities, suggesting the need for an alternative.

During this time of economic and environmental turmoil, GG emerged as an attractive economic strategy in comparison to traditional prescriptions. Although the action plans of GG resemble a traditional Keynesian stimulus, proponents argue that the Green stimulus, unlike the Keynesian stimulus, promises both short-term and long-term benefits. They reason that while the Keynesian stimulus steals resources from the future to give to the present (Jacob, 2012), investing in GG serves the common interest of not only present but also future generations. Furthermore, proponents argue that GG

offers more diverse tools, such as tax or regulatory policies in addition to public deficits, which can provide the same multiplier effects as a Keynesian stimulus (Jacob, 2012). In addition to these benefits, green investments are thought to perform better than a conventional stimulus in the short term, as green projects are usually labor intensive and create green jobs (Engel & Kammen, 2009). Ultimately, GG seems to embody an attractive alternative for the developed world that not only satisfies an ethical imperative, i.e., the protection and recovery of damaged ecosystems, but also promises to address immediate economic concerns through more diverse and flexible avenues than usual.

In the developing world, GG has been propelled both by internal demand and requests from outside. Recently, many developing countries have been experiencing some of the fastest economic growth rates ever recorded. At the same time, however, this growth has been accompanied by enormous pressure on the planet's biocapacity. The destruction of ecosystems has been directly linked with inequality and poverty in development countries, due to contextual circumstances in which developing world communities are more likely to depend on nature for their livelihoods. In the face of severe crises begotten by the occidental development path, the developing world has been seeking a development model that could better fit its own environment and set of circumstances (OECD, 2013c). Most notably, developing countries desire a strategy that can tackle poverty and address ecological concerns simultaneously. For them, GG is an appealing alternative path. As the UNEP declares, "one of the goals of a green economy is to help reduce poverty, while increasing resource efficiency and improving social welfare" (2010, p. 2).

The scientific community has established that developing countries must undertake climate change actions if the planet as a whole is to avoid ecological collapse (OECD, 2013c). Although the developing world's historical contribution to climate change has been comparatively minor, the recent rapid economic development there that has mirrored the occidental path could potentially drive the planet into catastrophe. International society has repeatedly called for a new development model to replace the typical resource-guzzling path pursued for the past two centuries, and GG has emerged as a promising candidate on the basis of its ability to satisfy the developing world's dual needs of economic growth and ecological protection (Bina, 2013; OECD, 2013c; UNEP, 2011). The affiliate agencies of the United Nations, whose missions are to eradicate poverty in the Global South, have taken the lead in conceptualizing GG and developing strategies for realizing a new global green economy. The OECD, a main driver of the international GG initiative, has also put considerable effort into its policy recommendations for developing countries. In 2013, the UNFCCC created a redistribution fund to help finance actions that counter climate change in the developing world.

6.1.4 Occupying the International Sustainable Development Discourse

During the recent years following the 2008 financial crisis, GG has played a key role in many political discourses, including international climate change and economic development. Major international organizations have plunged into developing GG strategies, not least of all the OECD, which has been a global leader in GG research and policy development. The GG section of the OECD website (<http://www.oecd.org/greengrowth>) provides a list of all the OECD-produced strategies and policies, as well as catalogs the organization's attempts at spreading the

idea of GG. During the years following 2013, the OECD has released more than 60 publications on GG, including strategies, policies, evaluating indices, and examples of policies across the world. The promotion of GG has recently emerged as a key mission of this agency, as the OECD website states:

The OECD is mainstreaming Green Growth in its national and multilateral policy surveillance exercises to provide policy advice that is targeted to the needs of individual countries. These include the Economic Surveys, Environmental Performance Reviews, Innovation Reviews, and Investment Policy Reviews, as well as the Going for Growth annual report and the Green Cities Programme. These analyses will cover advanced, emerging and other economies (<http://www.oecd.org/greengrowth>).

The Green Growth Knowledge Platform (GGKP) was launched in 2012 by four international organizations: the OECD, Global Green Growth Institute (GGGI), UNEP, and World Bank. The collaborative platform is aimed at generating and managing the theories and practices of GG and sharing this knowledge with the world. Thirty-nine international organizations and institutions that have performed research or otherwise contributed to the GG initiative have joined this platform as knowledge partners. In June 2012, the world's six largest development banks, the African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, and World Bank, pledged to use their financial and technical resources to help the world economy transition to GG. Their commitment to backing the strategy strengthens the possibility that GG will become a new widespread development model.

The number of countries that have jointed the GG initiative has rapidly increased in recent years. As of June 2015, forty-two countries have signed the OECD declaration on GG adopted at the Meeting of the Council at Ministerial Level on June

25, 2009, including Australia, Austria, Belgium, Canada, Chile, Columbia, Costa Rica, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Morocco, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Tunisia, Turkey, the United Kingdom, the United States and the European Union. The OECD declaration establishes a series of common efforts for realizing GG to include encouraging green investments and the utilization of a mix of market-based instruments, regulations, and other diverse policies, promoting comprehensive domestic policy reform to avoid environmentally harmful policies, reinforcing international cooperation for green technology development and diffusion, liberalizing the trade of environmental goods, and helping developing countries to promote GG (OECD, 2013c).

GG arose as a key international agenda during Rio+20, i.e. the United Nations Conference on Sustainable Development, which was held as a 20 year follow-up to the Rio Earth Summit of 1992. The conference adopted guidelines on green economy policies and emphasized GG as a tool for achieving SD (sustainabledevelopment.un.org).

6.2 What is Green Growth?

6.2.1 Definitions of Green Growth

The concept of GG has been developed by both academics and international organizations under slightly different titles and with slightly different features. Ekins (2000) is recognized as having first coined the term to refer to environmentally

sustainable economic growth, or GDP growth that improves human health, well-being, and quality of life while ensuring that ecosystems are protected. According to Ekins' definition, GG entails that the economic development trajectory shift its primary focus away from unlimited material expansion so as not to sacrifice the environment (Hong, 2011).

While Ekins identifies GG from a comprehensive and structural perspective that views the economy, human well-being, and ecosystem health all as integral parts of a connected cycle, Huberty, Gao, Mandell, and Zysman consider the fundamental task of GG to consist only in addressing CO₂ emissions, defining GG as “job creation or GDP growth compatible with or driven by actions to reduce greenhouse gases” (2011, p. 6). In contrast, the World Bank's definition of GG expands the strategy's environmental aim to include a more diverse set of issues beyond reducing CO₂ emissions and focuses on GG's ability to foster a virtuous cycle between economic growth and environmental health.

Green Growth is growth that is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters (Fay, 2012, p. 30).

Unlike the World Bank's definition that confines GG to the economic and environmental realms, other international organizations approach the concept from more of a political economic perspective that encompasses economic, environmental, and humanitarian considerations. The UN in particular has been a fervent advocate of the green development initiative since the WCED and UNESCAP began to use the term GG directly. At the fifth Ministerial Conference on Environment and Development in Asia and the Pacific in March 2005, UNESCAP embraced the

environmentally sustainable economic growth approach for the first time when it began formulating a GG strategy. UNESCAP (2008) defines GG as follows:

A regional strategy for achieving sustainable development ... Green Growth advocates growth in GDP that maintains or restores environmental quality and ecological integrity, while meeting the needs of all people with the lowest possible environmental impacts. It is a strategy that seeks to maximize economic output while minimizing the ecological burdens. This new approach seeks to harmonize economic growth and environmental sustainability by promoting fundamental changes in the way societies produce and consume.

UNEP has developed its own Green Growth approach under the labels “Green Economy” and “Global Green New Deal”. The green economy of UNEP is similar to the GG strategy of UNESCAP in that it focuses on modifying the conventional capitalist modes of production and consumption. In contrast to UNESCAP’s idea of GG, however, UNEP lists the environmental issues to be addressed by the green economy specifically and directly points out the expected social and economic benefits of this initiative. According to UNEP’s definition,

A green economy is one in which the vital links between economy, society, and environment are taken into account and in which the transformation of production processes, production and consumption patterns while contributing to a reduction per unit in reduced waste, pollution, and the use of resources, materials, and energy, waste, and pollution emission will revitalize and diversify economics, create decent employment opportunities, promote sustainable trade, reduce poverty, and improve equity and income distribution (2011, p. 35).

UNEP’s global green new deal emerged during the global financial crisis of 2008, which has been considered the worst global economic recession since the Great Depression of the 1930s (Barbier, 2010). Compared to the GG strategy of UNESCAP and green economy of UNEP, the global green new deal places considerably more stress on the economic side of green development and the direct economic outcomes

of green initiatives. Barbier defines the global green new deal in a paper that was prepared for the Economics and Trade Branch, Division of Technology, Industry and Economics of UNEP as follows:

While the focus of a global green new deal is on policies aimed at reducing carbon dependency and improving the management of ecosystems and fresh water resources, such a strategy is not just about creating a greener world economy. Ensuring the correct mix of global economic policies, investments and incentives can achieve the more immediate goals of stimulating economic growth, creating jobs and reducing the vulnerability of the poor and the long-term aim of sustaining recovery (2010, p. 5).

Similarly, the concept of GG formulated by the OECD reflects the global green new deal's focus on reviving the world economy that now finds itself in the midst of recession. However, the OECD's GG can be distinguished by its attempt at finding a balance between the economic progress of modern capitalist society and Earth's limited biocapacity. The OECD stresses that its idea of GG constitutes a paradigm change in this regard. Moreover, the OECD places greater emphasis on GG's role as a growth engine than others, reflecting the organization's mission to promote greater economic cooperation between its 34 developed country members. The OECD's Interim Report of the Green Growth Strategy outlines a detailed plan for "greening" the global economy, in which it particularly emphasizes the need for cooperation between developed and developing countries. The OECD suggests that diffusing green technologies to the developing world and lifting trade barriers are vital for securing common prosperity.

Green Growth is the means by which the current economy can make the transition to a sustainable economy. It involves promoting growth and development while reducing pollution and greenhouse gas emissions, minimizing waste and inefficient use of natural resources, maintaining biodiversity, and strengthening energy security. It requires

further “decoupling” of environmental impacts from economic growth, and greening of consumption and production patterns, while reducing poverty and improving health and job prospects. Green Growth means making investment in the environment a new source of economic growth (OECD, 2009, p. 1).

Overall, it may be concluded that the GG strategy, which was initially envisioned as tackling multiple problems including environmental issues, poverty, and social injustice, has since shifted to emphasizing economic growth as its top priority.

6.2.2 Common Denominators of Green Growth Initiatives

One single definition of GG has yet to emerge as the standard in the international arena. But although the meaning of the concept varies depending on the perspectives of its formulators, there are several commonalities among the multiple strategic visions of GG. It is evident that securing economic growth through environmental protection is the shared aim of each strategy, and also clear that all believe economic growth is the main engine for improving human welfare. In short, promoting economic growth is the primary goal of GG initiatives. Another common denominator for GG strategies is an emphasis on reducing the environmental burden of economic activities. It is commonly perceived that the planet cannot continue to sustain the environmentally destructive production and consumption cycle in which human society is currently engaged. Climate change, deforestation, resource depletion, water pollution, etc. have emerged as some of the most significant problems facing the capitalist economy in recent times.

GG seeks to differentiate itself from the old “brown growth” economic ideal that prosperity can come only through environmental exploitation. The founders and practitioners of GG strategies argue the need for constructing entirely new social, institutional, and material infrastructures to improve human prosperity and avoid

ecological collapse. They also argue that adopting a strategy of GG presupposes a holistic institutional change that encompasses both the public and private sectors and includes an appropriate mix of green tax and Cap and Trade policies, the revision of a fiscal plan, the creation of an incentive and regulation system, the transfer of the energy supply system to renewable energy, the change of business practices, and the establishment of inclusive decision making. Proponents of GG believe that societies can obtain a variety of benefits by pursuing this path, such as the creation of jobs, higher income, and a better quality of life.

The evolution of GG is visualized in Figure 6.2.

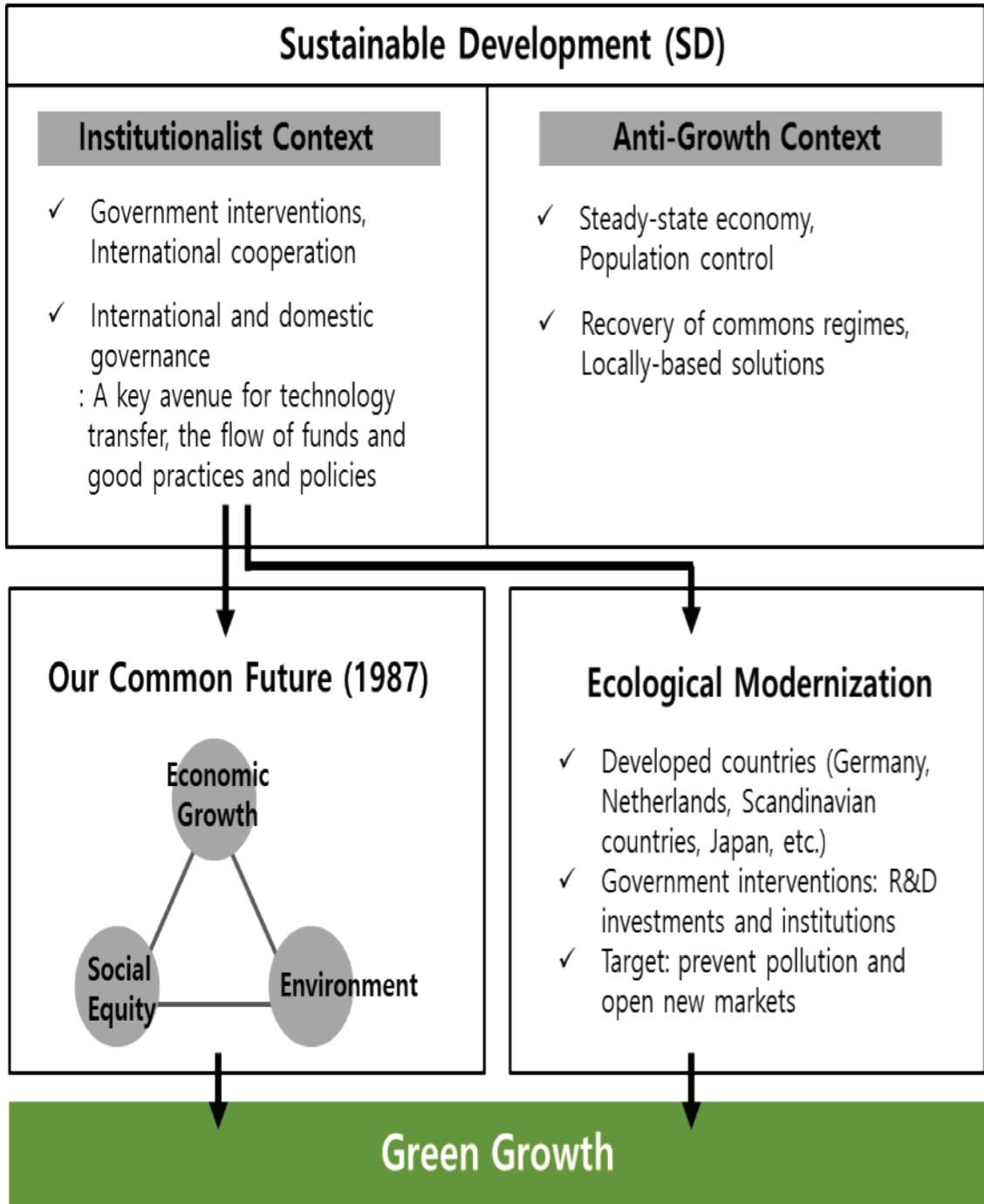


Figure 6.2: Evolution of GG.

6.3 The Korean Green Growth Initiative

The Korean Green Growth Initiative (KGGI) was introduced by former President Lee Myung-Bak in a speech celebrating the 60th anniversary of the country's founding in February 2008. The President declared the KGGI to be a new development paradigm that would lead the reorganization of economy and society, stating:

I present Low Carbon Green Growth as a new vision of country. Green Growth is a sustainable growth. It is a new national development paradigm that creates new growth engine and jobs through green technology and clean energy.

Following the announcement of the KGGI, South Korea has become a fervent supporter of GG in the international community and has also integrated GG into many of its domestic policies. The KGGI has occupied a privileged place at the top of the national agenda and helped to steer the direction of other national policies. Moreover, the Korean government has actively participated in international efforts aimed at spreading GG all over the world. While President Lee was in office, South Korea was one of the main countries driving the GG discourse internationally (UNEP, 2010; Jones & Yoo, 2011).

6.3.1 Background on the Birth of the Korean Green Growth Initiative

A specific set of conditions led to South Korea adopting GG as its new development model. First of all, there was the fact that the country's industrial structure relied heavily on certain inputs. Korea had achieved unprecedented economic growth in a very short time relative to other capitalist economies thanks to a massive input of cheap and abundant labor and society's resources. Cheap resources and

energy have been the backbone of the Korean economy and ensured its competitiveness even after the cost of labor rose alongside the nation's development.

However, skyrocketing resource costs in the mid and late 2000s began to undermine the nation's industrial base. This situation represented a significant problem for a country importing 98% of its total energy resources, and raised concern over the sustainability of the economy (The Presidential Committee on Green Growth of Korea, 2011; Lee, 2009). To make matters worse, global market conditions were then changing in a way that was highly unfavorable to the country. New strong competitors like China and India, armed with cheap and abundant labor, broad domestic markets, and comparatively abundant domestic resources threatened to take over traditionally Korean-led sectors. It also appeared as though South Korea would soon lose its lead in the traditional brown industries, including heavy industry and the chemical industry (Kang, Oh, & Kim, 2012).

At the same time, climate change was becoming one of the largest issues in international politics. Of course, climate change had long been a key topic of concern on the international stage. Korea, as a major emitter of GHG and with high per-capita GHG emissions, was also contemplating the task of setting future emissions reduction targets under future international climate change agreements. Growing concentrations of CO₂ and frequent extreme weather events were also pushing these countries, held responsible for climate change, to take action. The strategy of GG, which was gaining popularity under these circumstances, caught the eye of the Korean leadership.

In early 2008, the newly launched Lee Myung-Bak administration was looking for an alternative economic development strategy to jumpstart the country's growth. The new administration had earned considerable votes in the past election on the basis

of Lee's previous accomplishments as a businessman, and was in great need of an economic strategy that could help reverse the former leadership's disappointing performance. The concept of GG was attractive to the new leadership as it promised a new mode of growth in contrast to the conventional formula that required high amounts of resource inputs in exchange for high returns. The basic concept that growth could be obtained from technology that also would protect the environment and resources seemed tailor-made for the resource-poor country of South Korea. Also, GG promised to help meet public demand for a better environment that was projected to continue to rise along with improvements in income and living conditions (Choi, 2013). Moreover, the country was ready for a new economic development strategy in which technology was the driving force. Four decades of rapid economic growth had blessed Korea with a large amount of accumulated knowledge and a highly educated populace, which the new leadership believed would grant the country a high possibility of success in competition with other developed countries. In short, GG offered a chance to change the economic makeup of Korea. Also, as there was no country currently leading the international effort for GG, the administration saw that there was a chance for South Korea, a moderately powerful country, to contend for a position of international leadership (Presidential Committee on Green Growth, 2011). If Korea led the international GG discourse, the Lee Myung-Bak administration could make a significant impact with its foreign policy.

The new administration attributed the difficulties dragging down the progress of Korean society to the absence of a medium and long-term national development strategy. The introduction of neoliberalist economic policies introduced after the IMF bailout crisis in 1998 and the institutionalization of a five year single-term presidency

as a result of country's democratization in 1987 had resulted in the Korean government's abolishment of the tradition to develop medium and long-term national economic development plans. The Lee administration believed that South Korea needed a medium and long-term plan for the sake of the nation's future. It was thought that a set of short-term policies, each with only a four or five year life span, could never bring forth a meaningful change in the economy or society. For the Lee administration, the KGGI represented the medium and long-term vision that could change the economic and social structure of the country. The factors that motivated the Korean government to actively adopt the strategy of GG and promote related policies are clearly identified in the statement of Interviewee 1, an architect of the KGGI:

My responsibility assigned by President was to find a key word for the medium and long-term direction of Korea. President thought that we needed a medium and long-term vision at the 60th anniversary of country's founding... The age of high and rapid growth was already done though we still adhered to the mode of old economic development pursuing high growth. In that mode, we couldn't see any prospect of our economy. Also, it was another problem that the long-term development plan disappeared from the government because the life span of policies became short by the five-year single-term presidency. Another problem we concerned was the low status of Korea at the international politics. Our economy advanced to the top 10 at the global market but we haven't had any influential voice at the international politics... We found a breakthrough from climate change. It looked good for us to lead Korea to a new development path through that agenda.

6.3.2 Characteristics of the Korean Green Growth Initiative

Various contextual circumstances in South Korea influenced the KGGI, causing it to take on certain characteristics different from the prototypical GG template. Those characteristics primarily reflect the KGGI's status as a government-

led development strategy and its focus on funneling substantial government resources towards ensuring Korea would assume a position of leadership in the international discussions on GG.

6.3.2.1 Revival of Development State

South Korea has been considered an iconic example of a development state since the government has led the nation's push for economic development through extensive market intervention since the Korean War. However, the IMF bailout crisis that the country faced in 1998 forced a change to occur in this development model. Following the 1998 bailout, the Korean government ceased its creation of five year national economic development plans and a significant portion of power shifted to the private sector (Kim, 1999). The extensive economic liberalization policies enacted in accordance with the bailout conditions prescribed by the creditors were responsible for facilitating this change.

Once in office, President Lee, who arose as a prominent businessman during a time when Korea experienced significant economic development, criticized the country's lack of a dominant economic objective and steering body. The emergence of the KGGI as a key policy objective in the Lee administration signals a revival of the development state as the South Korean government took most of the initiative's key policies straight from the development state toolkit. Most prominently, the KGGI resembles a typical development state policy in that the government presents an overall direction for the nation's development, decides on the targets that the economy will pursue, and announces a resource mobilization plan for achieving them. Accordingly, the government announced the "Five Year (2009-2013) Green Growth Implementation Plan" detailing how Korea was to grow its economy as well as the

various action and investment plans that would be performed during this time. Alongside the deployment of the KGGI Five Year Plan, the policy focus of each Korean government department was reorganized to ensure Green Growth was at the center. The Presidential Committee on Green Growth, was also established under the control of President to head the initiative. The country's renowned specialists in the fields of energy, climate change, and green technology were placed on the board and public officers from all economic affairs departments were chosen for its executive body. A legal framework for the KGGI was established through ten acts, including the Framework Act on Low Carbon Green Growth and Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy.

However, despite the KGGI closely resembling a prototypical economic policy of the development state, it also clearly differed from this model in a few aspects. To be precise, the KGGI follows the basic formula of development state policies aside from certain key market-based programs, namely the Korean permit trading system and Renewable Portfolio Standards.

6.3.2.2 Supplying Ideology for Business

Recent actions taken by the Korean government creates a strong impression that the primary aim of the KGGI is fixated on helping the country become an international leader in GG. The enormity of governmental resources poured into Korea's leadership effort cause this goal to stand out amongst the other major KGGI targets. Several policies related to this objective have been enacted. For example, South Korea took the lead in founding the Global Green Growth Institute (GGGI) dedicated to helping developing countries and emerging economies transition from the traditional economic development model to Green Growth. The GGGI was officially

established in 2012 at the Rio+20 United Nations Conference on Sustainable Development with Korea having provided USD30 million worth of funding (The Presidential Committee on Green Growth of Korea, 2011; www.gggi.org). The GGGI marks the first time Korea has led the founding of an international organization. The GG partnership Korea entered with the World Bank represents another one of the country's efforts to cement itself as a leader. This partnership, established in 2011, sees the two entities collaborating in the production and dissemination of knowledge associated with GG for the purpose of assisting the sustainable development of developing countries. In a related foreign policy, the South Korean government decided to increase the proportion of the nation's green Official Development Assistance (ODA) funding from 14% of total ODA to 30% by 2020. Korea furthermore contributed USD 200 million to help fund the climate change mitigation and adaptation actions of developing countries in Asia through the East Asia Climate Partnership (EACP), an international initiative for global cooperative development led by the Korea International Cooperation Agency (KOICA), an organization created to help tackle climate change in developing countries and promote GG in Asia. Finally, on the basis of the Korean government's endeavors, the country was able to succeed in hosting the Green Climate Fund (GCF) after beating a powerful competitor Germany in 2012.

At this point, one might wonder why the Korean government has been so intently focused on positioning the country as an international leader in GG. To identify the government's motive, one only need recall President Lee's definition of GG as "a sustainable growth". The KGGI is a growth strategy. Consequently,

governments have crafted a relationship with the market as one of the key agents of the economy.

While the Lee Myung-Bak government intended to revive and utilize the Korean development state to create new engines for growth, the administration soon discovered that circumstances had completely changed from the past. In a globalized market system dominated by neoliberalism, the only thing left for the state to do was to play the role of international ambassador on the behalf of domestic corporations and advertise their green image to the world. Various statements made by interviewees illustrate this point.

If industries led Korea's economic development in the sustainable green look go into developing countries, they are going to be market that Korean companies take lead (Interviewee 1).

It was an effort to export the word Green Growth to the world (Interviewee 4).

Green Growth is a foreign policy. It was to strengthen the voice of Korea at the international arena. Through it, Korea aims at form upgrading national image as a responsible member of international community (Interviewee 10).

Ultimately, it is the nation's image, specifically the image that the nation's economy is responsible, inclusive, green, clean, technology that is often projected onto the country's corporations. As Interviewee 1 notes, one of the KGGI's main goals was to ensure domestic corporations had a sustainable, or green, appearance. These days, fostering the environmental stewardship of businesses is a necessary condition for developing new green markets. The suspicion with which local communities view foreign capital has risen during recent decades (Harvey, 2006) as a result of past experiences whereby the investments of Multinational Corporations (MNCs) disrupted nature and caused conflict among classes and regions in recipient countries (Becker,

2011; Calvano, 2008; Pant, 2003; Adeola, 2001). Knowing this to be the case and expecting resistance, the South Korean government and businesses decided to pursue complementary but parallel strategies related to Green Growth. Namely, the Korean government focused on creating and spreading the image of a green, high-tech, and responsible nation, while domestic businesses, cloaked in this image, worked towards conquering world markets. Korea's sponsorship of diverse knowledge sharing projects and provision of aid to developing countries for climate change adaptation and mitigation can be interpreted as a strategy to instill the image of a country committed to sharing its prosperity with world rather than attempting to obtain dominance, as has often been the case with conventional capitalism. As Interviewee 4 said, the Korean government has attempted to lead the international movement for GG and export this concept to the world in order to catalyze the growth of domestic businesses. Accomplishing this task has required a great deal of work on the government's part, as producing the ideology to support corporate activity still remains out of reach for even the country's world-class corporations like Samsung or Hyundai.

6.3.3 Key Policies of the Korean Green Growth Initiative

The Korean government has deployed broad and comprehensive programs in support of its GG initiatives, including the establishment of national economic targets, the introduction of diverse policies for climate change, energy, and green purchasing, and the establishment of a legal framework and governance system to guide this approach.

Created in 2009, the National Strategy and Five Year Plan for Green Growth set a target for Korea to become the 7th strongest GG country in the world by 2020. This policy detailed the Korean government's commitment to spending 2% of its GDP

over the next five years (2009-2013) on investments for green technologies, resource and energy efficiency, renewable and nuclear energies, water and ecological infrastructure, green buildings and transport, and other forms of green development. Including these financial provisions in the plan reflected the Korean government's will to reorient national policy toward GG as well as its desire to take real action rather than make empty declarations (2010, UNEP). As a means of cementing Korea's financial commitment to GG, the government also allocated 95% of its USD 38.1 billion fiscal stimulus (3% of its GDP) to green initiatives between 2009 and 2012. The Green New Deal Plan, undertaken to overcome the country's economic recession in the wake of the 2008 global financial crisis, also contributed to the aim of the KGGI by adding 956,000 new jobs in green industries.

In addition to the policies discussed in the previous paragraph, the Korean government dedicated considerable resources to restructuring institutions and establishing a stable source of funding for GG. In January 2009 the National Assembly passed the Framework Act on Low Carbon Green Growth, which outlined the aim of the Korean GG strategy and dictated the changes expected for all sectors of society. Around the same time, the Korean government also declared that it would shift the orientation of private-public finance to developing green technologies and fostering green industry. It was further decreed that government spending amounting to 2% of the nation's GDP would be invested in GG initiatives, and a Renewable Energy Fund of USD 72.2 million would be established. Green technologies related to solar, wind, and hydroelectric power generation were also expected to attract significant private investment.

The Korean government dedicated a large proportion of its efforts to creating a number of policies directly related to achieving GG as well. Of these policies, a few key programs occupied considerable government resources, including the four rivers restoration project, energy system reforms, clean technology investment, and the Korean permit trading system. The following chapter provides a detailed description and analysis of these programs to determine whether the KGGI can be accurately called a paradigm shift.

Chapter 7

STATUS OF NON-ECONOMIC VALUES AND PROGRESSIVE TECHNOLOGY PREMISE OF THE KGGI

Chapters 7 to 11 present a policy analysis of GG. Chapters 1 to 6 established the theoretical foundation of the study. In these chapters, I described the theoretical framework of the study and provided a theory level analysis of the prevailing PP and GG. This theory-level analysis focused on the key characteristics of the PP—and its resulting crises —and introduced the origins, definitions, forms, and multiple discourses of GG.

The theory-level discussion of GG in chapter 6 provides the groundwork for the paradigm analysis conducted at the policy level. The policy-level analysis aims at discovering whether the ideals of GG are realized in its actual policy initiatives by analyzing actual programs of the KGGI. The five core characteristics of the PP described in chapter 4 are used as benchmarks for testing whether major KGGI projects show meaningful deviations from the PP.

Chapter 7 is dedicated to examining whether the KGGI reflects the PP’s belief in material progress and technological optimism. This chapter answers to the question: “Can programs implemented under the KGGI improve the quality of life for citizens and promote other values aside from economic growth?” Moreover, this chapter investigates whether GG makes a true effort at addressing the unknown and uncontrollable risks that can result from technological progress and allows citizens, whose way of life is greatly affected by technologies, the opportunity to be included in

the processes that decide which technologies are to be prioritized by society. If it is concluded that the programs implemented under the KGGI still reflects the same technological optimism and emphasis on material growth of the PP, then GG can hardly be considered a shift away from business-as-usual.

7.1 Quality of Life in the KGGI

The Korean government set quality of life as one of the main goals to be attained by the KGGI. The initiative focuses on achieving three elements: creating a virtuous circle between the economy and environment, improving quality of life, and enhancing the nation's international presence by actively complying with international imperatives. These goals stemmed from a reflective consideration of the modern risks that the unquestioned economic growth path had begotten as described in the previous chapter. If GG truly betters the well-being of humanity rather than the quantitative expansion of the economy, it earns a meaningful point on the way towards qualifying as a paradigm shift. The research question explored in this section concerns whether the KGGI's stress on quality of life deviates at all from the old belief that material progress, as estimated in GDP, is actual progress *per se*.

Identifying what exactly constitutes the quality of life that the KGGI pursues provides a good starting point for this discussion. The quality of life sought by the KGGI is ambiguous. Diverse interpretations of this concept are detected not only in the government-owned research institutes' publications providing the theoretical basis for the KGGI, but also in interviews with Korean public officers. Two key men of the KGGI define the concept from different perspectives. One (Interviewee 2) approaches it from the view of economic equality and job security, pointing out one crisis that has to be addressed by the KGGI is the growing income and opportunity inequalities in

Korean society. On the other hand, the other person (Interviewee 3) perceives the quality of life as relating to environmental aesthetics. According to him, economic growth has had precedence over all other values including the environment in South Korea and thus the right to enjoy a sound environment has been suppressed. In other words, he understands the quality of life component of the KGGI to mean protecting the people's right to enjoy a sound environment.

The meaning of quality of life in the KGGI also can be identified by analyzing the specific programs designed to improve it, including low-carbon land-development, eco-space expansion, green market construction, green transportation system and public transportation system facilitation, and so on (Committee on Green Growth, 2009).

7.1.1 Identification of Threats to the Quality of Life

7.1.1.1 Economic Uncertainty and Social Alienation

As Interviewee 2 points out, one notable anomaly facing South Korean society is the ever-heightening gaps in the economic arena. These gaps encircle all levels of economic relations and include such phenomena as the wealth disparities between the rich and the poor (and between large and medium-and-small businesses), and wage disparities. Although Korea's GDP followed the path of unremitted expansion prior to the KGGI, the gaps have continued to worsen. Economic polarization has been a hot controversial issue facing the country (Yeo, 2015; Kim & Kim, 2015; Chang 2015). Of course, as has been the case with climate change in the US, Korean parties reflect a split of deniers and advocates of the economic polarization phenomenon. Even within the advocate group, there are those who believe in laissez-faire remedies and those

who support strong intervention. But regardless of whether one takes the stance of denial or advocacy, the modern illnesses South Korea is facing are identical to those of matured industrial capitalist societies. Contrary to the capitalist tenet of Kuznets (1955) and Rostow (1959), which proclaims that material wealth beyond a certain level can be a panacea for modern illnesses, the murky scenes of the world after the financial crisis of 2008 became commonplace. Speth vividly describes the problems present in the world champion of capitalism, the U.S.:

A tiny minority have experienced soaring incomes and accumulated grand fortunes while wages for working people have stagnated despite rising productivity gains and poverty has risen to a near thirty-year high. Social mobility has declined, record numbers of people lack health insurance, schools are failing, prison populations are swelling, employment security is a thing of the past, and American workers put in more hours than workers in other high income countries. (2011, p. 181)

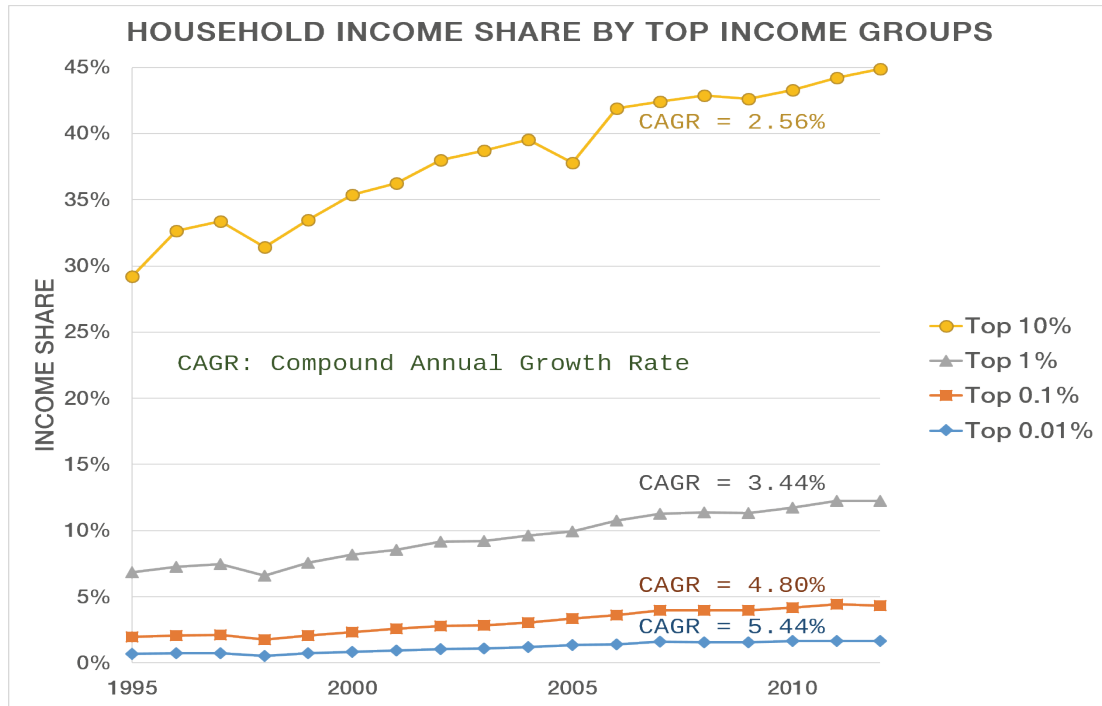
Moreover, Beck (2006) characterizes the present world as the world risk society. He argues that humanity lives in 'Second-Modernity' in which risks are cultural unlike in 'First-Modernity' in which risks arise from socio-economic conflicts between labor and capital as well as the international conflict between East and West. Risks in 'Second-Modernity' override humanity's conventional wisdom and knowledge, leading to a failure of the modern expert system. They encompass challenges generated by the modern system like climate change and threats from the global financial movement, as well as conventional risks relating to class and religious conflicts. Due to the complexity of these problems and their comprehensive chain reactions, the black box of modernity that attempts to produce solutions according to its own embedded logic rarely succeeds. Rather, solutions from the box are intensifying the modern anomalies.

South Korea, having dashed forward towards the rosy prospects promised by industrial capitalism, is not exempt from these risks. Controversies over social topics such as jobless-growth (Ha & Lee, 2001; Kim & Park 2006; Grubb, Lee, & Tergeist, 2007), social polarization (Koo, 2007; Atkinson & Morelli, 2011; Yoon, 2015), the trap of low growth (Kang, 2015; Werner, 2015), crisis of locality (Kim, 2015), and government dysfunction (Yang, 2001; Wilson 2015) are omnipresent. These risks have contributed to an upsurge in social tension as well as to the mental fatigue of citizens. According to recent OECD data, South Korea has had the highest suicide rate of all OECD countries for 10 consecutive years: 2002 to 2012 (OECD, 2013a). While the average instance of suicide for all of the OCED nations was 12.1 deaths per 100,000 people in 2012, South Korea's suicide instance was 28.1 per 100,000. Another recent report by the OECD revealed that only 36% of South Koreans felt satisfied with their lives, much lower than the OECD average of 59% across its 34 member states (OECD, 2014a). Korea also ranked 25th with Japan in terms of average self-evaluation of life satisfaction, one of the 11 topics in the OECD's Better Life Index based on data from 2010 (OECD, 2014a).

Income inequality in Korea has already reached a serious level. Gini coefficients place Korea in the mid-group of OECD countries, realizing the range of 0.335~0.352 during 2003 through 2011. However, the ability of Gini coefficients to estimate actual inequality has recently come under fire (Druckman & Jackson, 2008); with some calling attention to the model's problems of under-coverage and under-reporting (Kim & Kim, 2013). A considerable number of top income households are excluded from the Gini calculations and financial income is substantially underestimated. Gini coefficients also leave the contributions of self-employed and

family workers out of household income estimates by using only the earnings of wageworkers. Despite the government's use of Gini coefficients to argue that South Korea's income distribution is comparatively sound (The Hankook Ilbo and Yonhap News November 12, 2014, TV Chosun November 13, 2014, Asiatoday November 17, 2014), Kim and Kim (2013)'s study that utilizes income tax data suggests that the income inequality of South Korea is 20% higher than the statistics of government agencies, such as National Statistical Office and the Bank of Korea, would indicate.

Figure 7.1 drawn with the data of Kim and Kim demonstrates the historical changes in Korean income inequality from 1995 through 2012. According to the figure, the shares of top income groups have been growing steadily. In 1995, the share of total household income of the top 10% of Korean households was 29.2% before soaring to 44.9% in 2012. The latter percentage was close to the level of the US (48.16%), which had the most serious income inequality in the world that year (Piketty & Goldhammer, 2014).

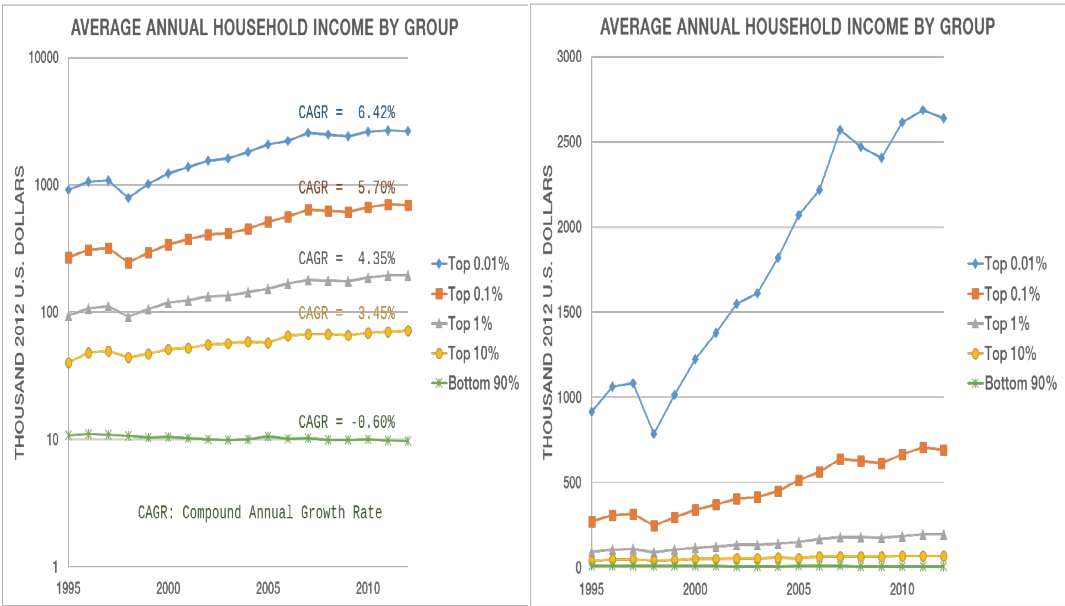


Data: Kim & Kim (2014).

Figure 7.1: Shares of Households Income by Top Income Groups

While income has escalated among the top earners, the bottom 90% of Korean household's income has actually decreased. The two charts of Figure 7.2 graphically depict the opposite movements of the top and bottom groups. The left chart is plotted with a logarithmic scale on the Y-axis to show the growth rate in income of each class. The right chart uses a natural scale on the Y-axis and shows the trend of income inequality. The top 0.01% families gained an average of USD 917,193 in 1995 and achieved USD 2,639,751 of income per family in 2012, with the annual growth rate reaching 6.42%. The top 0.1%, 1%, and 10% income groups also showed positive CAGR even though the growth rate became smaller at the lower income groups. However, the bottom 90% households could not catch up to the trend of the top 10%

as their income has shrunk by 0.60% annually. In 1995, an entire family in this income bracket earned an average of USD 10,840. In 2012, their income fell below USD 10k, to USD 9,784.



Data: Kim & Kim (2014)

Figure 7.2: Average Annual Household Income by Group

Ever-deepening income inequality and weakening job security can cause serious life anxiety. In the globalized economy, people detached from the means of production lose their autonomy to provide for their sustenance. For Koreans especially, who have pursued material growth as an overarching value in the modern era, the shaking prospect of the modern capitalist tenet casts a large shadow over their livelihood security. As the size of the national economy and the wealth of the top 10% grow, the litany of struggles the bottom 90% face become more and more intense.

Even salaried workers with decent jobs at big conglomerates maintain the everyday anxiety that they can be dismissed from their jobs at any time. Involuntary early retirees who opened their own businesses continue to flow to the low-income groups after being defeated by huge multinational giants who compete with them for sales in their very own communities. According to a 2001-2012 analysis by the KB Bank and Financial Institution, only 24.6% of small businesses stayed in business after 10 years of starting up (<http://www.kbfg.com/kbresearch>). In addition, 47% of them lost their businesses in three years.

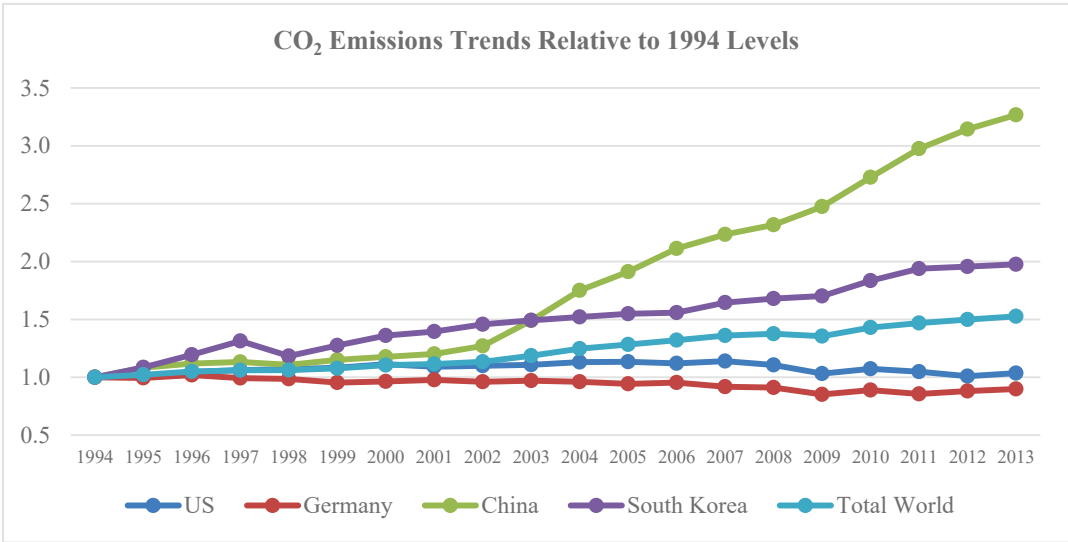
The increasing community fragmentation and social exclusion following this late 20th century period of rapid economic growth in South Korea broke the traditional form of social security or safety net that was informally provided by family, friends, and neighbors. According to OECD analyses, South Korea shows a moderate social solidarity. In 2014, 72% of South Koreans surveyed by the Gallup World Poll said they knew someone they could depend on in a time of need, less than the OECD average of 88% and in the bottom third of OECD countries (<http://www.oecdbetterlifeindex.org/topics/community/>). Korea's relatively low social solidarity is in marked contrast to the Amish community, a closed-off society located in the heart of the modern state of Pennsylvania in the US, that has adhered to a traditional consumption and production system (Gingrich & Lightman, 2006). Although hard labor and a low level of affluence characterize Amish life, the Amish can expect enough cooperation from the community in their time of need. For modern South Koreans, this is not the case. The uniformity of the social value that orients Koreans towards amassing greater levels of wealth and material comfort encourages competition rather than cooperation.

7.1.1.2 Environmental Degradation

Alongside the unease of trying to sustain their livelihoods in the face of economic uncertainty and social alienation, environmental degradation also threatens the quality of life for many Koreans. Ultrafine particles in the air flowing into the country from China, symbols of this large, rapidly industrializing nation, are some of the monsters endangering citizens' health (KBS1 'Window', June 2, 2015; The Chosun Ilbo, April 7, 2015). Disruptive weather due to climate change is adding another layer of harshness to the overall agony of living. Increasing instances of intense heat and cold, floods, and typhoons are breaking the morale of vulnerable citizens (Joongang Sunday, May 31, 2015). The pollution of the sea, which supplies considerable nutrients to South Koreans, is also a big nuisance. The world's biggest landfills, the plastic islands in the Pacific Ocean, continue to release chemical toxins into the water. Toxins accumulated in the tissues of marine life are coming to dinner tables through the food chain (Kostigen, 2008).

Meanwhile, the aftershocks of the 2011 Fukushima Nuclear Accident are still being felt. In February 2014, a major leak of about 100 cubic meters of radioactive water from an overflowing water storage tank at Fukushima Daiichi Nuclear Power Station was detected. According to *The Japan Times* (September 11, 2014), about 300 to 400 tons of groundwater flows into reactor buildings each day and becomes contaminate with radioactive substances. As Japan is approaching the limits of its capacity to keep the contaminated water in tanks, IAEA recommends that the country consider releasing some of the radioactively contaminated water under a certain standard into the ocean. This worries Korean citizens, as the country shares the Pacific Ocean with Japan. In addition, despite Korea's ambitious national strategy of GG, CO₂ emissions continue to grow rapidly, even after 2009 when the KGGI was kicked into

high gear. While Germany is achieving negative growth in its CO₂ emissions and stabilizing downward, Korea still realizes high growth in CO₂ emissions relative to the benchmark year 1994, placing the country second behind China in 2013 as shown in Figure 7.3.



Data: BP Statistical Review of World Energy, June, 2014

Figure 7.3: CO₂ Emissions Trend Relative to 1994 Level

The preceding paragraphs expose a darker portrait of South Korea that lurks beneath the fanciful façade of a modern society built by unprecedented high-speed growth, which many countries in the world now look to as a role model for their own development. There is no question that Korea’s aggregate wealth and economic scale has grown and is still growing, but the vast majority of benefits are confined to the top 10% of the population, while the anger and dissatisfaction of the remaining 90% becomes increasingly palatable. Meanwhile, pollution has improved remarkably in

Korea, but the structural, ecumenical, and environmental hazards conceived by the industrial capitalist economy have grown more dangerous.

7.1.2 Green Society Disconnected from Citizen Realities

Despite these problems, the KGGI did not directly address the roots of the crises that are disturbing citizens' quality of life. As discussed above, anomalies threatening citizens' quality of life stem from ever-growing income inequality, heightening mental fatigue caused by rising social tensions, increasing alienation that is disintegrating the safety nets individuals used to have to fall back on, and environmental degradation. A paradigm shift is possible only when countermeasures are effective for addressing the causes of this unhappiness.

Table 7.1 shows strategic targets and action plans in the Five-Year Plan for Low-Carbon Green Growth (2009-2013) that seek to improve the quality of life for South Koreans. Glancing at the targets and specific action plans for addressing the issues discussed above leads us to doubt their effectiveness in overcoming citizen unhappiness. Dissatisfaction originates from the personal reality each person lives; however, the countermeasures of the KGGI still remain in the realm of an abstract and objectified whole that omits the everyday circumstances of citizens in their social contexts. For people having to tangle with pressing issues such as employment, housing, income, health, security, and the living environment, little meaningful change can be found in green construction projects, such as the expansion of railways and bike lanes, or green housing that are unilaterally presented by the government as means of improving social well-being.

Table 7.1: Targets and Action Plans for Improving the Quality of Life in the KGGI

Strategic Targets	Quantitative Targets	Projects
Greening land and water, and building green transport infrastructure	<ul style="list-style-type: none"> - Expand nature reserves from 100,000 ha (2009) to 150,000 by 2020 - Increase share of rail ridership from 18% (2009) to 26% by 2020 - Increase share of cycling in urban passenger transport from 1.5% (2009) to 10% by 2020 	<ul style="list-style-type: none"> - Creation of carbon-neutral cities - Construction of 1.5 million social housing units and 2 million green housing units - Implementation of an evaluation system for green buildings - Construction of new railway lines and of 3,000 km of bike lanes
Bringing the green revolution to daily lives		<ul style="list-style-type: none"> - Increase number of green households from 160,000 (2009) to 1.5 million by 2020 - Increase number of goods for which the carbon footprint is awarded from 50 (2009) to 1,000 by 2020 - Increase public consumption of green products from USD 2 million (2009) to USD 8 million by 2020 - Construct 500 ecological cities by 2020

Source: The Presidential Committee on Green Growth (2009a).

The stress on quality of life in KGGI can be considered a value change if it promises to make ‘humanization’ an embedded social value, as the ‘dehumanization’ of modernity left no space for the context of social reality (Ellul, 1964). It is the result of the artificiality component of modernity that values, institutions, and social practices are given their own autonomy apart from the business of humanity. From the

above strategies, one can tell that the artificiality of institutions and values is still strongly embodied in the KGGI. Even though citizens express their agonies in having to subjugate themselves to the nation's pursuit of global capital, authority abides by the usual script of attempting to achieve abstract numerical targets, expand physical facilities, and secure ambient aesthetic beauty. The sanitized, prosperous world that the government creates is only an artificial reality to citizens who are facing their own fiercer, more immediate realities; in other words, a green society is a fairyland that may exist in government documents, but has nothing to do with them personally. Projects of the KGGI such as green housing, green buildings, bike lanes, and carbon-neutral cities to improve the quality of life embody this artificial reality *per se*. At best, these projects are merely technical ways that authorities are pulling from the black box of modern solutions provided by the present paradigm. Bike lanes that zigzag in beautiful patterns across the land can be a boast of a country heralded for its green initiatives, but for the majority who struggle simply with maintaining their health and livelihood, these symbols of environmental progress can be little more than chunks of asphalt taking up space. Likewise, green buildings can contribute to CO₂ emission reductions, but these structures only make up the outer skin of cities, masking the potentially numerous afflictions inside. Needless to say, green buildings and green cities on their own are all but worthless if they are apathetic to the numerous realities and stories of citizens.

7.1.3 Green Actions to Boost Economy

Green consumerism's central role in projects designed to improve quality of life in Korea casts doubt on the KGGI's ability to depart from a core tenet of the current paradigm, which states that the total material growth of a society improves

quality of life. Under long lasting economic stagnation and the modern production and consumption mode that exploits resources and degrades the environment coming under criticism as of late, green consumerism meets the need for corporations and rich countries to cultivate new economic territory and support moral imperatives at the same time.

As a key feature of the current paradigm, citizens remain seen as only economic boosters circulating money rather than as the main agents of the KGGI's promised paradigm shift. Rather, green consumerism can exacerbate the problems citizens are facing in terms of quality of life when it echoes the prevailing consumption and production mode that isolated consumers from the means of production in the first place. This alienation becomes clear when contrasting the two methods of green consumption. One method is to purchase green-labeled products on the shelf of a retail store owned by a multinational corporation, while the other is to be a consumer as well as a seller of green products at a local farmer's market.

Also, policies that encourage greater energy consumption with loans and credit systems entail a steady increase of consumers' debt (Akenji, 2012). The consequences of these practical policies demonstrate that a slight strategic change for the untouchable end, economic growth, never brings about the enhanced well-being of humanity. This point is underpinned by a statement made by an interviewee, who said: "The initiation of the KGGI was to create a new blue print for growth. I don't think that it targeted restoring the middle class army or alleviating the economic polarization of the country" (Interviewee 9)

Bringing the green revolution to daily life should not be reduced to making the artificial reality more elaborate by encouraging green consumerism or making

aesthetic improvements to the external environment. In this moment, the economy is trapped in the pursuit of growth against the conventional wisdom that more and more growth does not bring about happiness. Capital wanders across the world looking for greater profits, while the security of individual livelihoods becomes more and more vulnerable. Both government and market, the main agents distributing resources, react lethargically to social dilemmas. Fragmented individuals' living in the height of modernity begin to feel the need for alternatives to the present paradigm. In this regard, looking for alternatives begins by questioning the prevailing idea of 'the good life' and examining what it will take to improve quality of life. There are at least two ways of doing this. One is that everyone continues to pursue material growth as usual but in a slightly more efficient and less environmentally harmful way. The other is to create a diverse set of lifestyle alternatives, not only by promoting a culture of 'green chic' but also by strengthening solidarity across communities in harmonization with nature.

7.2 Promethean Technology

As discussed in section 4.2, technology has been positioned not only as an absolute value but also as an essential means to be modern. Even given its impaired credence in recent decades, it is difficult to deny that technology still works powerfully in every corner of our lives. It is critical to examine what has happened with respect to the belief in technology in order to detect the presence of a paradigm shift in the KGGI. In this section, the position of technology in the KGGI is described, then I discuss whether there has been a fundamental change that would fulfill the two conditions of a paradigm shift in the values and power relations that promethean technology has generated.

7.2.1 Green Technology as Pivotal for Green Growth

Green technologies are the key elements of the KGGI. The Korean government imparted a significant meaning to green technology as a pivotal means of accomplishing GG. The National R&D Plan for Green Technologies, a-sub national policy of the Five-Year Plan for Green Growth, notes: “Green technology is the kernel of the new development strategy, which builds a virtuous cycle between environmental protection and economic growth by contributing to low-carbon Green Growth” (2009, p. 1). The Korean government established an aggressive system to drive policies for green technology development and commercialization. As a first step, the Korean government announced the ‘National R&D Master Plan for Green Technologies’ in January 2009. According to the plan, the Korean government aimed to position itself as a green leader in the global arena. It declared that it would rush into the green race among developed countries such as the U.S., EU, Japan, etc. having armed itself with advanced green technologies. At the time this plan was being drafted, Korea’s green technology level was only 50-70% of what developed countries had achieved (The Government of the Republic of Korea, 2009). The Korean government set the goal to advance nation’s green technology to 80% of developed countries by 2012 and 90% by 2020.

The goal of the R&D master plan was to enhance Korea’s green energy competitiveness by lifting up the country’s level of technology and increasing Korea’s piece of the global market share of green industry from 7% in 2012 to 10% in 2020. It was argued that this would also create 160,000 jobs related to green technologies. As a result, it was expected that Korea could join the group of top ranking OECD countries in environmental sustainability. Refer below to Figure 7.4 Vision and Goal of National R&D Plan for Green Technologies.



Source: The Government of the Republic of Korea. (2009)

Figure 7.4: Vision and Goal of National R&D Master Plan for Green Technologies.

The green technology R&D field was the biggest beneficiary of the ambitious goal. The Korean government selected 27 technologies as a priority for investment. Table 7.2 lists the 27 key technologies. These technologies were categorized into 5 sectors: climate change forecast technology, energy source technology, high efficiency technology, after-usage disposal technology, and non-pollution industry economy. Those priority technologies were chosen through an assessment of growth and green impacts that resulted from a discussion and consultation with related ministries, experts, and industries.

Table 7.2: Key Green Technologies Chosen as Priority for Investment

Climate Change Forecast Technology	Energy Source Technology	High Efficiency Technology	After-Usage Disposal Technology	Non-Pollution Industry Economy
Monitoring and modeling for climate change	Silicon-based solar cells	Plant growth-promoting technology	Alternative water resources	Virtual reality technology
Climate change assessment and adaptation	Non-silicon based solar cells	Integrated gasification combined cycle	Assessment of water quality and management	
High efficiency fuel cells	Light-water reactor	Intelligent infrastructure for transport and logistics	Waste recycling	
	Next-generation fast reactors	Green cars	Non-CO ₂ processing	
	Nuclear Fusion energy	High-efficiency LED/Green IT	CCS	
	Hydrogen energy	Secondary battery	Monitoring and processing for hazardous substance, etc.	
	Bio energy	Green city and Urban restoration and renewal		
	Green buildings	Green Buildings		
		Green process technology		
		Smart grid		

Source: The Government of the Republic of the Korea. (2009).

The expansion of green technology R&D was also promoted alongside the selection of the 27 priority technologies. The Korean government promised to double total investment in those 27 technologies by 2012, which was envisaged to come to USD 110 billion. It also planned to incrementally increase the share of green technology R&D investment every year, which remained at only 15% of total R&D expenditure as of 2008, and finally 22% in 2012. During 2009-2012, the amount of green technology R&D investment remarkably grew from USD 20 billion in 2008 to USD 35 billion in 2012, resulting in a cumulative amount of USD 130 billion. Table 7.3 shows green technology R&D investment in Korea during this period.

Table 7.3: R&D Investment in Green Technology (2009~2012)

Year	R&D Investment (National Total) (A)	R&D Investment to Green Technology (B)	Ratio of R&D to Green Technology (B/A)
2009	\$123 billion	\$20 billion	16.5%
2010	\$137 billion	\$25 billion	18.3%
2011	\$149 billion	\$21 billion	19.5%
2012	\$160 billion	\$35 billion	22.2%

Source: The Government of the Republic of the Korea. (2009).

In addition, the Korean government made efforts to build green technology governance and infrastructure. The Green Technology Center (GTC) was to be the first think-tank established to support policy planning that specializes in green technology. Along with the GTC, joint research centers between universities and

government funded-research institutes form green technology cluster and test beds, which would act as research hubs for the country. Collaborations among industry, universities, and government research institutes to develop technologies were encouraged. R&D results were shared among them and the government supported commercializing the outputs. Building a global cooperation network was also a major task. Incentives to attract leading international research institutes and human resources were formulated. Tax and financial incentive schemes for green technology development were mobilized as well. The proportion of tax deductions for green technology R&D investment increased by more than 20%. Green technologies and companies received preferential treatment for loans and guaranteed judgment. Discriminative tax and financial incentive schemes were applied to private companies based on the intensity of their green technology development efforts.

Keeping pace with the government, large Korean conglomerates joined the green technology race. Samsung Electronic Co. announced a new vision ‘Creating New Value through Eco-Innovation’ (July 20, 2009). The vision contains four key action plans: investing a total of USD 5.4 billion into green innovation; reducing GHG emissions per sales unit by 50% and increasing energy efficiency 40% by 2013 (for a total reduction volume of 84 million tons); creating 100% good eco-product by 2013; and forming green innovation partnerships with cooperative companies. Hyundai-Kia Motors also enacted ‘Investment Plans for Green Innovation’ (July 22, 2009) encompassing four similar targets: investing USD 4.1 billion into green innovation between 2009 and 2013; establishing a mass production system of eco-friendly vehicles to become the 4th largest green car company in the world; developing high

efficiency and energy-saving engines, transmissions, and materials; and reducing CO₂ emissions at production sites.

As seen above, the confidence in technology as providing a core avenue for achieving GG was strong. Accordingly, substantial political, institutional, financial, social resources were put towards the development and commercialization of green technology in both the public and private sectors.

7.2.2 Green Technologies Seen as Key Solution for Challenges to the PP

As discussed in chapter 4, the PP puts great faith in technology as the means of presenting humanity with a ‘promethean revolution’ (Small & Jollands, 2006). Notwithstanding the alarming and formidable events that past technology has begotten, it is a core tenet of the PP that technology can remedy the dark side of technological phenomena with more advanced technology that will bring about greater benefits. This tenet is also firmly rooted in the KGGI. The former President Lee Myung-Bak defined that the KGGI’s new development paradigm would be achieved through advanced green technologies and clean energies. As stated in a speech he delivered on the 60th anniversary of the Republic’s national founding, “it is a new development paradigm which creates new growth engines and new jobs through green technologies and clean energies” (August 15, 2008).

Examining the role of green technology as a core countermeasure to social and environmental crises manifests the KGGI’s embedded faith in technology. Table 7.3 reveals the South Korean government’s perspective on technology. The KGGI expects technology alone will fix the challenges that the Korean society confronts, such as the energy crisis, eco-system change, and competition over the emerging green industry market.

Table 7.4: Role of Green Technology as Core Countermeasures to Crises in the KGGI

Goings-on	Targets and Technologies
<p>Deepening Energy Crisis</p> <ul style="list-style-type: none"> - Dependence of 97% of total primary energy supply on overseas' sources - 5.8% increase in annual average energy consumption per capita 	<p>To increase the nation's energy independence and diversify its sources of energy</p> <ul style="list-style-type: none"> - Solar cells, Nuclear, LED lighting, Smart Grid
<p>Rising concerns for transformation and adaptation to the change of ecosystem</p> <ul style="list-style-type: none"> - Average temperature in Korea increased by 1.5°C in the last 100 years (0.74% worldwide) - Likelihood of 15~40% extinction of species for every 2°C increase of earth's average temperature 	<p>To increase protection for ecosystem through the precautious investment in the environmental protection technology</p> <ul style="list-style-type: none"> - Climate change forecast, CCS, waste and water management
<p>Emerging low-carbon green industry markets</p> <ul style="list-style-type: none"> - Potential for growth in carbon trading market and green industry (\$3 trillion by 2020) - Green technology race among developed countries such as the U.S., EU, Japan, etc. 	<p>Structural transformation to a low-carbon industry by greening of industries and land, and developing zero-emitting operational technology</p> <ul style="list-style-type: none"> - Smart transportation and logistics, urban restoration and renewal

Source: The Presidential Committee on Green Growth in Korea. (2009b).

No one can deny that technology has made human life more convenient and better. Technology has improved the sanitation of human-made environments in cities. Pollution control systems have helped to ameliorate poor air quality in industrialized countries. Advanced sewage treatment systems have revitalized streams and rivers. Hybrid cars, LED lighting, and Smart Grids will likely contribute to greater energy savings and CO₂ emissions reduction. But just as technology has enabled a more convenient and comfortable life, its nasty side effects are also crystal clear. While

humans race to create state of the art technologies, the life support system of the earth is failing. Climate disturbance is ever growing. Repeated nuclear accidents in developed countries pose a potentially grave threat to humanity should they continue to happen. Bio-energy crops have caused a hike in crop prices so that the basic necessity of the most vulnerable people in the world is at risk. Rapid and large-scale biodiversity loss puts the livelihood of people heavily relying on nature, as well as nature itself, in severe peril.

The notion that advanced technology and innovation themselves can be panaceas for these problems and lead to a new paradigm must be examined, as a paradigm shift hinges on a change in the way technological innovation is valued. If technology is still regarded the same way as in prevailing value system, it itself can never solve the anomalies that call for a paradigm shift. This idea is supported by numerous examples in the recent affluent decades. Even after the Three Mile Island and Chernobyl catastrophes, optimism for technology has stuck firmly in humanity's mind. This technological optimism has been universal regardless of social position, with experts, government officials, and laypeople alike heralding it as the way forward. The Fukushima accident in 2011 made governments across the world consider phasing out nuclear power plants or stopping the expansion of nuclear generation. However, at this moment, the nightmare of Fukushima is being displaced by the aspiration for the cost-efficiency and economic potential of nuclear power. Nuclear energy, despite its potentially dreadful risks, is elevated to the status of a priority technology in various innovation projects of many countries. But technological innovation taking the same direction as before may only succeed in cloning the same anomalies, even if new technologies are introduced. Even worse,

technological crises may be even more complex and harsh in the future due to the application of more advanced and labyrinthine technologies.

7.2.3 Efficiency: The Standard for Choosing Green Technologies

While it is an irrefutable fact that technology has brought forth nasty problems, we do not need to go to the extreme of abhorring it. Though the potentially negative side effects of technologies are enormous, the potential benefits to humanity are as well. Which and how technologies are applied is the important choice humans face. According to Ellul (1964), even though the Ancient Greeks possessed highly advanced scientific knowledge, they were reluctant to apply it for practical use, recognizing the unrestrained forces deeply embedded in techniques and their potential for causing calamities. Unlike most modern people, the Greeks were vigilant to avoid succumbing to material comfort at the expense of losing mastery over their lives. Relatedly, Ellul sees that the problems of the modern technological society are rooted in its overemphasis on modern techniques. In the modern world, technique reflects only one dimension of existence, namely, 'rationality' realized in the form of "systemization, division of labor, creation of standardization, and the like" (Ellul, 1964). This norm of rationality is employed in every single technical operation. Although the intervention of technology is the organic outcome of the living milieu of the time and reflects the present conceptions of value, power relations, and social development, it reduces everything to just one standard: efficiency (Ellul, 1964).

Under the triumph of rationality, another characteristic of the technological society, 'automatism of technical choice' (Ellul, 1964) prevails. It is believed that there exists the 'one best way' (Ellul, 1964) for rationality. Society works to find that one best way by following a formulaic method in which everything is measured and

calculated mathematically. In this process, there is no space to reflect the diverse values of society. Reducing everything to reason leads to the dissolution of value diversity. That is to say, the choice of technology only obeys the norm of rationality.

In order for a paradigm shift to happen, technology as one essential means for modern civilization has to be understood and utilized from the perspective of ethics and not only reason. The inherent criteria for choosing technologies under the PP can be summed up as reflecting two goals: cost-efficiency and economic growth. Under a new paradigmatic era, alternative values such as social context, individual circumstances, human well-being, decentralization, and inclusiveness have to be integrated into technology choice. Particularly in an era in which the policy direction of government has a large influence in shaping society and citizens' life, the government has to be undoubtedly careful when intervening and making these choices. Because the government's decision-making criteria for prioritizing technologies reshapes citizens' life patterns and ambience, as Tatum describes

Ordinary roads, which are financed by taxes and are planned, organized, and executed by the government, actually crowd out walking, bicycling, and other possible modes of transportation, including otherwise mass-transit alternatives. In the process, they advantage automobile technology, with its attendant suburbanization, commuting, energy consumption, pollution, and other pattern (1995, p.92).

According to the perception of the former President Lee Myung-Bak and high level government officials engaged in the promotion of the KGGI, the Korean government appears to still be lingering in the realm of the PP. As already mentioned, the former President Lee thinks that the value of green technology lies in its efficiency to spur new growth engines. Interviewee 3 has a similar view in that he believes green technologies will be the new sources of material growth.

Of greens, I had keen interest in how we could nurture green industry... I believed that it was the biggest task to develop new engines for businesses and alternatives to IT industry as the main wealth resource of the national economy... I had a confidence in green energy technologies as avenues for generating energy in a different way from the conventional energy system or managing conventional energy in a more efficient way. I saw a big potential of them as new sources of value added. To make Green Growth succeed, I thought, star products such as semi-conduct, cell phones had to be borne out of green industry, too.

His response shows that the way technology is valued in the KGGI repeats the traits of the PP. The value of technological innovation for him concerns only how it can expand and sustain material wealth. This was observed in the other interviewees as well without exception. Interviewee 1 equates technology to industry when he argues, “Green industry is a different name of green technology”, meaning that technologies are interpreted and evaluated only from the perspective of industrial value. The 27 key green technologies chosen as priorities for investment (Refer to Table 7.2) also showcase the Korean government’s firm belief in technology and reveal its strong will to maintain the current energy and production system. It can be easily deduced that nuclear and end-of-pipe technologies, such as CCS, take up considerable importance as core technologies. Even continuing nuclear accidents were not enough to push aside adherence to this source of cheap and large-scale energy, which secures the cost-efficient criteria. Interviewee 6 speaks for that idea inherent in the KGGI as follows

It is an unquestionable truth that nuclear has to be the main energy source of Korea. It is cheap, bottomless, and affluent. Even though the probability of accident is very low, once it happens, damage is catastrophic... There was no accident in Korea since we introduced nuclear generation in the 1960’s. No one imagined an event like the Fukushima nuclear catastrophe. There is a risk though, nuclear energy is still the answer for our economy in the general situation (Interviewee 6).”

No evidence suggests that the Korean government has attempted to reflectively reconfigure technological innovation with the KGGI. Technology is still supposed to only serve one purpose: industrial competitiveness. Consideration of the dark side of the technological society scarcely affected the technologies chosen as crucial for shaping society's future. In this situation, the set of technologies of the KGGI reproduces the value system that has triumphed in contemporary society. Alternative values that are not easily quantified, such as social context, human well-being, decentralization, and inclusiveness have no room in this new system put forth as a supposed new paradigm. This is because the belief in technology is tightly combined with the faith that material growth is progress *per se*. Given that economic growth remains an absolute value technological innovation that secures mass production in the most cost-efficient way possible cannot help but be praised as the way forward.

7.2.4 Main Agents of Technological Innovation in the KGGI

In the industrial world, technology has shaped human life. Aviation technology removed the geographical limitation of human migration. Nuclear technology transformed patterns of warfare. Google has embedded itself into nearly every aspect of human life, from entertainment to geographic navigating and even scholarly research. Despite its comprehensive influence on modern men and women, control of technology has remained in the hands of a small, elite group of experts who legitimize its privileged place in society by citing its supposed value neutrality. The argument goes as follows: Technology never allows any class-bias or arbitrary ethical judgment to affect change; it is always founded on the basis of objective scientific calculations or experimental results. The most efficient technology wins over others and this is fair, in other words. However, this conventional wisdom is easily falsified.

A specific scientific technology serves a specific end. A nuclear weapon was developed for a political end, i.e., defeating enemies with mass destruction. New technologies developed by Apple serve to increase shareholders' wealth. As Procter (1991) points out:

A nuclear power plant, cruise missile, or linear accelerator can hardly be used for ends other than those for which they are designed. Science-based technologies are increasingly end-specific: the means constrain the ends; it is no longer so easy to separate the origins of a tool from its intended use (p. 3).

Technology cannot be separated from its developer's purpose and perspective. Accordingly, it embodies the values of its developers and helps to sustain their economic, social, and political privileges. Thus, as long as a value change does not predate the technological innovation, new technologies succeed only in fortifying the political economic structures that uphold the current paradigm. In the preceding discussion, it was concluded that there is no evidence of a value change in the KGGI, meaning that the technological innovation in the KGGI cannot make any contribution to changing the social benefit distribution system of Korean society.

Mumford (1964) defines the characteristic of modern technology that rules over every aspect of humanity's life as 'authoritarian technics'. He maintains that the rule of authoritarian technics generates the social environment that then generates democratic authoritarian contracts. In this milieu, humanity unquestionably plays the role of 'Faust' by selling its soul to authoritarian techniques in exchange for material compensation. There is a solid foundation that enables the reign of authoritarian technique. It is the power structure of modern society that can be called the 'Technology and Power Elite Co-Op Civilization'. Mumford's authoritarian techniques exactly match the interests of this power structure. In this structure, minor

power elites¹¹ possess political and economic power. Their power is completely different from that of a divine king or church and exercised in a different manner. It is a power based on wealth and knowledge, which tacitly and unofficially exerts an influence on official decision-making and the creation of institutions.

The distinguished feature of this power structure can be found in the social role that scientists play. Positivism, an epistemology that has occupied the philosophical domain for the last 200 years, presupposes the existence of an absolute truth that is unalterable regardless of social context or circumstance. For positivists, blocking the intervention of value and subjectivity is the sole way of approaching the truth. The role of scientists is supposed to make the given truth more sophisticated rather than to criticize or provide alternatives to the existing social structure. Under this circumstance, the identity of the social or natural scientist does not matter; they are only technicians dealing with statistics, mathematics, and numbers. As a result, these technicians lose the power to unveil the actual reality of the world. They serve only the vested authorities by supplying knowledge that entrenches their rule and governance. As compensation for their efforts, scientists are allowed to share some power and material wealth with the ruling power, as Anderson mentioned

Most economists are salaried employees of universities, state agencies, and research institutions. This places them in the ideological stratum of what is often called “the new class.” More than any other numbers of this stratum, they have an intimate link to the ruling class. The content of their work directly addresses its problem few economists perceive their lives in these terms” (Anderson & Locke, 1987, p.39)

¹¹ I borrow the concept of power elite from ‘The Power Elite of C. Wright Mills’. According to Mills, “The power elite if composed of men whose positions enable them to transcend the ordinary environments of ordinary men and women; they are in positions to make decisions having major consequences” (1963, p, 3).

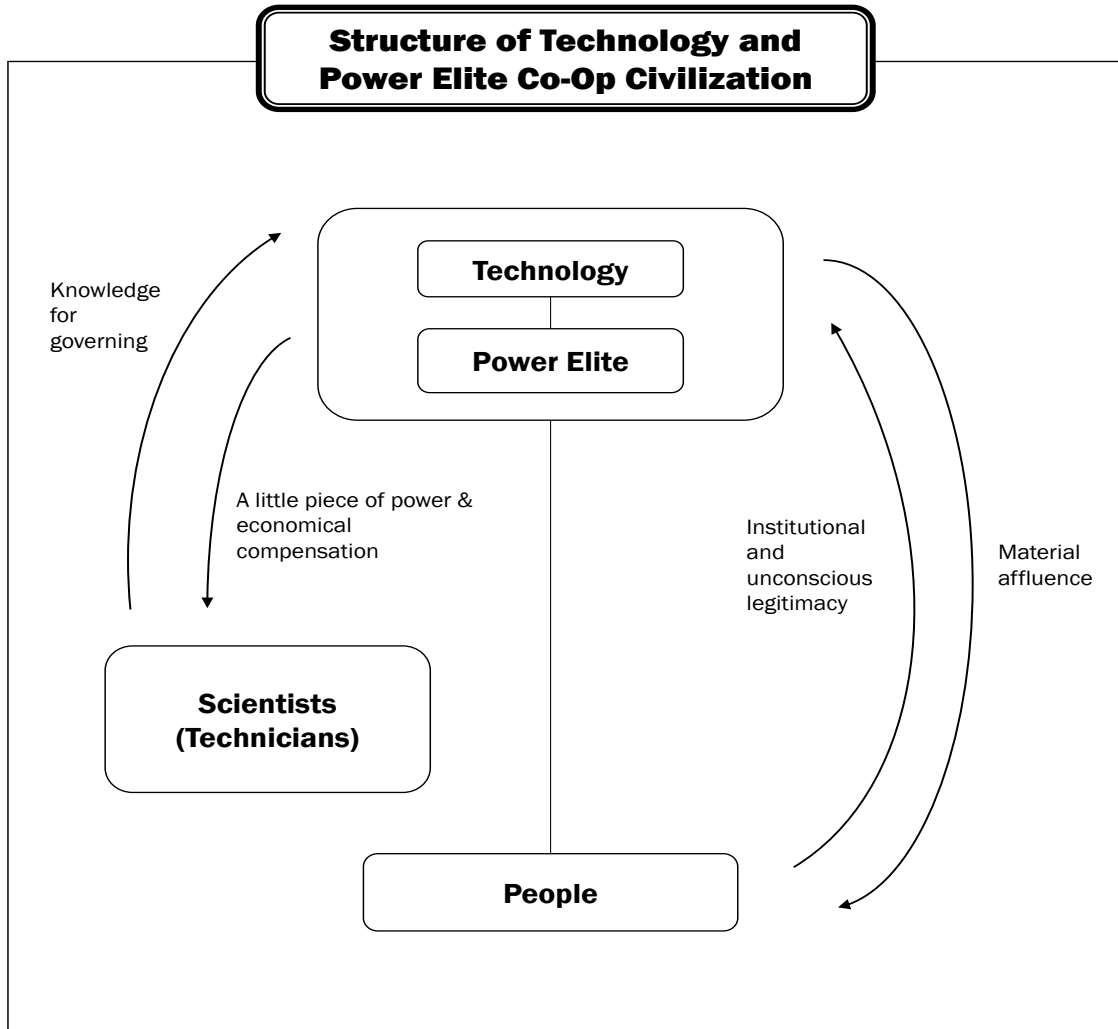


Figure 7.5: Technology and Power Elite Co-Op Civilization.

In the process of deciding social order and resource distribution, numbers and formulas are rampant and laypeople can easily become lost in the labyrinth of alienating technologies and statistics. People become indifferent to their responsibility to supervise the ruling forces and lose their ability to influence the trajectory of history, succumbing to it powerlessly. It is natural that people who are used to legitimize the existing power structure can be placated by the material comfort that

this power structure provides. Figure 7.5 shows the operating principle of Technology and Power Elite Co-Op Civilization.

South Korea is no exception to the Technology and Power Elite Co-Op Civilization. In the process of shaping the KGGI, the cooperation of the technological and power elite was strongly evident as the decision to make technological innovation the main driving force of the new strategy was accepted without question. Furthermore, there was no criticism in using taxpayer money to increase the national investment in technology development. In this process, any voice worried about inequity—that is to say, the weighted distribution of government funds to big conglomerates already well-equipped with qualified human resources, accumulated knowledge and experience, and an international R&D network—was too small to influence public opinion in a significant way. Government officials were preoccupied by the rule of cost-efficiency. Interviewee 3 took prioritizing big conglomerates for R&D investment for granted.

I tried to make a change in LED lighting industry. I questioned who would buy such an expensive lightings like LED if they were products of small and medium sized companies with no brand power. Only international champions such as Samsung, LG could compete with international technology companies such as Philips and Osram. I thought that the division of labor was more efficient. It would be so much better if SMEs could take up the supply for big conglomerates.

The Korean government consulted with various experts in choosing the 27 key priority technologies. The purpose of that arrangement was not only to acquire outside professional opinions but also to create democratic procedural legitimacy for the action. Of course, this procedure was not very democratic in the true sense of the word as citizen participation was excluded from the technology prioritization process; it was taken for granted that only experts would be consulted. The remark of Interviewee 12

shows the belief that the domain of science and technology has to be separated from democratic engagement in order to reach the most objective conclusion. His remarks also indicate that he thinks the consultation with experts that did take place was not sufficiently objective and therefore harmful to the strategic choice of key technologies.

Specific field like the selection of key technologies had to be a clear top-down way. Yet, it mixed bottom-up style into the decision-making procedure. Integrating technologies, which each government department selected or related technology associations recommended, created the list of priority technologies. It is true that there is not only one future technology, though, I think, an objective and cool-headed assessment was not taken in the selection procedure.

In the modern technological society where technology shapes the mode of life, resource distribution, and social structure, the monopoly techno-rationality has over decision-making only reinforces the current paradigm. Power elites have utilized technology in reproducing their wealth and extending their influence in the ongoing paradigm. Future technology apathetic to any value other than market efficiency will still beget problems identical to those of present crises because the ultimate aim of market efficiency lies not in values of ethical justice such as equity, human autonomy, and inclusive coexistence, but in amassing the largest profit in the greatest economic terrain. In the political system called the acme of democracy, we witness the paradox in which people do not have any power to reshape their life milieu. As long as technologies that enable massive production at cheap cost win over policymakers and society, the winners of the current power structure sustain their power and profit from the system.

7.3 No Change in the Two Beliefs

The belief that material growth alone defines progress is the primary engine that fuels modern society's unrelenting drive towards a limited notion of well-being based on greater and greater levels of affluence. In the real world, this belief has served to underline the value of science and technology as powerful vehicles for achieving social prosperity. In this way, technological optimism and a belief in the value of material growth have worked hand in hand to reinforce each other as well as the modern paradigm. Thus, in order for one to claim that a paradigm change has occurred, one must first observe that meaningful changes have taken place in these two beliefs.

However, the discussion of this chapter reveals that the KGGI is merely a change in the way that economic growth is pursued or in the set of core technologies society uses to obtain it rather than a fundamental transition in the inbuilt values and power structures that serve the dominant interests of the old paradigm. At first glance, the KGGI seemed to indicate a possible paradigm shift in that it stressed the importance of improving quality of life instead of chasing only material growth. However, the KGGI projects centered on improving quality of life leave one with a strong impression that they are not promoting new values but instead echoing those found in the PP. The Korean government still adheres to the belief that economic growth can cure society's ills and that the artificial manipulation of the environment can make human life better. Although the KGGI was initiated in order to address modern failures, issues that are fundamental to human life and happiness are still relegated to the periphery. No hint is detected in the KGGI of efforts that could cure humanity's detachment from nature. It is also vague what non-economic values are being pursued in the initiative.

Accordingly, I hesitate to call the KGGI a fundamental shift away from the current value system that is fixated on correcting environmental ‘externalities’ that have the potential to interfere with the pursuit of material well-being. The KGGI focuses on creating a market for green products at a time when most of the populous still struggle with basic life issues that threaten Korea’s overall social and economic stability. This conclusion would contradict the Korean government’s argument that KGGI represents a paradigm shift.

In addition, even though the KGGI emerged out of critical reflections on the social and environmental ills that resulted from the practice of modern industrialism, the KGGI is nonetheless perpetuating and even intensifying modern society’s trust and dependence upon technological solutions. Material progress in the modern world is strongly founded on the belief that technology can remove any obstacle restricting humanity’s advancement, disregarding any fundamental limitation to growth that might derive from the planet’s natural capacity. The KGGI attempts to find ways of making economic growth commensurable with environmental protection through the use of more advanced technologies. Climate change, which is a core concern of the KGGI, is perceived as a matter that can be resolved with new energy technologies.

Architects of the KGGI also expected that developing countermeasures to climate change would provide the momentum for catalyzing the country’s stagnated economy. According to the interviewees, the main purpose of the KGGI was to foster economic growth through climate change mitigation; good will is a collateral benefit. As a result, the key technologies supported by the KGGI are chosen according to one standard: their anticipated potential to induce economic growth. The technologies that are selected are implicitly expected to be more efficient, cleaner, and able to continue

the mass production of energy. They may be more eco-friendly than traditional energy technologies, but the KGGI is more concerned with their ability to promote economic growth. If other, more diverse values such as equity, environmental ethics, community autonomy, sufficiency, peace, and protection for small economies were included in the selection criteria for technologies, then the KGGI's set of chosen technologies might have been much different.

It is clear that the values embedded in the current paradigm, including technological optimism and the equation of material growth with progress, remain unchanged even in this new growth initiative that is heralded as a paradigm shift. Although the KGGI has changed the tools used to achieve growth, it is highly unlikely that these new tools, which are designed for the same purpose as the old ones, will produce different outcomes. Moreover, the fact that the decisions surrounding the KGGI's selection of technologies remains dominated by select elites including government bureaucrats, related professionals, and industry representatives further supports the notion that the KGGI is not a genuine paradigm shift. If the main agents that have shaped the existing system also play a major role in creating a new system, the new system cannot help but maintain the same inequities.

In summary, the KGGI fails to replace the current paradigm's fundamental faith in technology and the ability of material growth to bring about progress. As such, it is inappropriate to think of the KGGI as a paradigm shift.

Despite failing to transcend the PP's emphasis on promoting material growth and technology, GG policies might have been able to create changes that could have better addressed the modern anomalies created or intensified by the PP. As described earlier, GG policies have focused their efforts on increasing environmental quality and

developing clean technologies for the purpose of improving the overall quality of life for citizens. But while there is little evidence to support a finding that GG policies have been successful in resolving the PP's anomalies, it is also difficult to conclude that these policies failed in this regard because the criteria to evaluate their effectiveness in achieving this goal have not been established. However, it can be observed that the current government policy setting is consistent with that of the former administration who granted the highest priority to GG policies, which implies that GG will not be able to achieve a successful policy shift.

Chapter 8

NATURE OF STATE AND CORPORATIONS RELATIONS IN THE KGGI

Chapter 8 analyzes the relationship between the Korean government and corporations as it was revealed during the formation of the major KGGI projects. The purpose of this chapter is to determine whether the KGGI represents a meaningful change in how political economic power was concentrated in businesses under the PP. The analysis proceeds by asking whether key projects of the KGGI—namely, the Korean Permit Trading Scheme and Automobile Subsidy and Levy—sufficiently consider the interests of general people and investigates whether their voices were fairly represented in the policy formation processes. If businesses continue to dictate the focus and content of KGGI policies, then GG cannot be considered a genuine paradigm shift.

8.1 Strong Power of Business in the Capitalist Economy

Markets are the key organs of the capitalist economy. In the modern world, the market, as Heilbroner points out, “is not just a means of exchanging goods; it is a mechanism for sustaining and maintaining an entire society” (1999, p.27). A founder of modern economics, Adam Smith (1991), believed that the market, when left alone, could direct the system to its highest return. However, the actual capitalist system, which has been generated by human desire for self-interest clashing with their desire to maintain positive social relationships with each other as well as with nature, has resulted in a market system materially different from Smith’s dream.

The orthodoxy of capitalism has been challenged by its many aberrations. In order to address the aberrations, the shape of the capitalist system has constantly mutated and varied depending on the context of each society. For example, the U.S. showed a minor variation from orthodox free market belief when the emergence of big businesses preceded the strong administrative nation (Wilson, 2003). In contrast, Scandinavian corporatist countries with a history of strongly bound interest groups and states chose to meddle into matters among interest groups to maintain the validity of market system. East Asian countries, which faced heightened competition in the international market from the germination stage of capitalism on, did not have time to wait for the growth of main players of economy. Therefore, states themselves rushed into actions that nurtured industries and big businesses.

Regardless of whether governments are elected or imposed, big corporations have had considerable influence in arranging the social order. This was possible partly because of a direct and intentional action on behalf of business groups to manipulate the flow of government policy by utilizing their huge resources that dwarfed those of other interest groups. It was also partly due to the belief system of the modern capitalist state that the liberal market, despite its manifold defects, is the most efficient system for helping humans achieve material affluence. In this section, the position of market and business in the Korean context is discussed and the faith in the liberal market is reviewed in view of its effectiveness as a mechanism in addressing apocalyptic environmental degradation. This chapter also analyzes the power structure of the KGGI. In particular, it will explore the conflicts and bargaining process involved in the introduction of the Korean cap and trade system.

As an exemplary case of the developmental state, Korean bureaucratic elites have exerted strong power over the economy. Of them, economic affairs departments have had stronger influence than social affairs departments and the balance of power has notably tilted in their direction. This mirrors the power structure among the interest groups of the society because each department has its own customers who have a similar stake in the formation of economic and social policy. In premising a different approach to economic development, the KGGI inevitably accompanies a change in the partnership between bureaucrats and their customers. As the KGGI progresses, the challenge and response occurred to the changes. It is also a task of this section to determine whether the KGGI could make a meaningful effort to dissolve the solid alliance between the government and its customers.

8.2 Main Agents of the KGGI: Market and Big Businesses

8.2.1 How the Korean Economy Changed from State-led to Market-Determined

Compared to the Western developed economy, the position of the market in South Korea is more complicated. As already noted, the power of Korean bureaucratic elites surpassed that of the market in the tradition of state-led economic development. Under the leadership of bureaucratic elites, South Korea achieved an economic miracle that annual income per capita shifted from \$80 in 1960 to over \$10,000 in the 1990s. During the same period, average annual GDP growth increased 8.7%. This rapid growth was unprecedented in the history of industrialization. However, the

government-Chaebol¹² strategic alliance led to widespread corruption. There was no system to check the bad practices of Chaebol under the connivance of the government.

The IMF bailout crisis in 1997-1998 brought about a big shift. The IMF and other international organizations demanded a fundamental change in the country's market system as a condition for the bailout loan. The conditions included sensitive economic issues such as "labor market rules, regulations of corporate structure and governance, government-business relations, and international trade" (Feldstein, 1998, p. 27). These were all core issues of structural reform especially in a neoliberal state. It was clear that the aim of the IMF was to shift the Korean development model from state-led to market-determined. As a result, the economy underwent a drastic change and South Korea was pushed onto the battlefield of free trade and freely moving international capital without any domestic institutional protections. Policy instruments that made the Korean economic miracle possible, such as trade barriers, limitations on

¹² Chaebols are the South Korean equivalent of large conglomerates. Historically, the growth of chaebols can be traced to the Korean government's strategy of developing the country's economy by promoting export-driven industries, particularly heavy chemical industries. Those industries demanded huge capital and the government granted them a variety of favors. Thanks to the strong protection of the government, Korean chaebols became influential corporations in the world market. In addition, they occupy a large portion of the Korean economy and exert a profound influence on it. The Korean word 'chaebol' contains two meanings: wealth and faction. Some critics refer to them as dynasties rather than mere companies (Cho, April 6, 2015). That is because key posts within chaebols are usually given to the biggest shareholders' family and control is typically passed to the descendants of the owners. Korean chaebols have kept control of the group through complicated cross-shareholding among subsidiaries. The way in which owner-families have sought to control companies through cross-shareholding with minor shares has been a core target of criticism of the Korean chaebols.

capital movement, and selective loans to domestic infant industries were completely removed.

The IMF bailout crisis became a critical turning point for policy direction in Korea. The five-year economic plan that led Korean development came to an end in 1998 when the leadership of economic development shifted from the government to the market. Diverse neoliberalist policies were introduced in the economic policy field (Kalinowski, 2008). A small government and corporate tax reduction became the hottest issues of political discourse. Every different administration after 1998 chose deregulation as a means to create a better business environment. Under this policy context, the government-business relationship changed shape. Once a hierarchical relationship, it turned into a more balanced one that gave more power to business. In the Korean milieu, the government always has intervened in economic and social issues to resolve conflicts and disputes, and, despite the changes, the government continued to influence the economic arena. It is not unusual for the President to meet with the presidents of major businesses regularly to ask for their cooperation in the government's economic policy targets. However, the power of government has over business noticeably lessened post-1998 because the government has only limited resources or policy tools to provide special benefits or protection to businesses compared to before the IMF bailout crisis.

8.2.2 The Resurrection of the State-Led Economy

President Lee Myung-Bak won the 17th presidential election with his vision for rebuilding a high economic growth country. It is believed that his background as a successful businessman in the era of the development state was primarily what helped him win the office. The KGGI shows the nostalgia of the government-led economic

growth era, as the framework of the KGGI was imported from the core feature of the development state. As the master plan of the KGGI, the Five-Year Plan for Green Growth was created as its foremost task. The plan set the KGGI's core targets and the role of individual government departments, the amount of public investment granted for the KGGI programs by year, and the expected effect of the KGGI. In many ways, the KGGI was the resurrection of the five-year plan for economic development. At the same time, however, the plan also clearly differed from the prior plans of the development state in that its core instruments are based on market liberalism. The most conspicuous and ambitious policy instruments for attaining the goals of KGGI—RPS (Renewable Standard Portfolio) and Cap and Trade—are core tools of market liberalism.

Market liberalism is based on the belief that market mechanisms surpass all other means of achieving public goals. Even in addressing the environmental problems that market mechanisms have generated, the belief in their superiority ironically holds firm. That is to say, utilizing market power is often believed to be the best way to achieve the greatest favorable output to the environment at the lowest cost. This belief is prevailing across the globe in the present globalized world. South Korea, which was incorporated into the regulatory state founded on market liberalism since the IMF bailout crisis, is not an exception. The Korean government made the division of labor between the two parties—market and government—clear. The state creates the institutional framework and technological innovation system, while the power of market achieves the goal. In other words, the success of the initiative completely depends on business. This choice of strategy was partly due to the limited capacity and

resources of the government, but mostly to the deep-rooted belief in the efficiency of market system

Interviewee 1, a national agenda setter, uses Cap and Trade as an example to explain why the KGGI constitutes a paradigm shift. He argues that Cap and Trade is revolutionary because it incorporates previously un-internalized environmental externalities into production cost.

In the conventional economy, externality has existed out of market. It has been considered as the byproduct of environmental input and output. The cost that it caused was not reflected in the market transaction, even if the cost has been imposed on the unrelated third party. Cap and Trade is to set the price of CO₂ and to take the externality into the market mechanism. It is to figure out the environmental problem on the basis of market mechanism. In addition, it will be beneficial to the national economy.

Interviewee 6, who is an economic affairs bureaucrat, articulated the strong conviction about the different relation between government and market from the previous era. He argued that the role of government has to remain at a minimum and that business needs to take over the leading role of driving economic growth.

In the previous government during last three decades, economic growth was achieved by the government leading. At this time, the private sector significantly grew in both size and capacity. It is a determined path that the role of government shrinks. Government has to get smaller. The function of government has to be restricted to that of the regulatory state. Business already leads and we can't go against the trend.

There was no difference in the perception of the function of the market for a bureaucrat from the environmental affairs department. Interviewee 7 stressed the industrial opportunity that Cap and Trade could create.

It is a misunderstanding that the Ministry of Environment prioritizes tackling climate change over the interest of industry. As other ministries do, we also think that climate change measures have to be introduced step-by-step protecting industries. In this sense, this

measure (Cap and Trade) is the most efficient way to reach targets. It is because of three aspects: first, it can make CO₂ emissions reduction happen, second, when it comes to force, Korea can demonstrate a significant existence as a leader at the international climate political arena, and lastly, it operates as a motive to facilitate new environmental industries and technologies.

The introduction of Cap and Trade was a groundbreaking action in the South Korean context. The key industries of Korea that have driven exports and economic growth are mainly high CO₂ emitters. Even if Cap and Trade operates by market principles and creates new economic opportunities for the market, the strong resistance from industries forced to bear new costs from the measure was very obvious. Moreover, it was an especially big challenge for the government to introduce the new measure, as many Korean industries possessed the power and resources to torpedo it if they so chose. Cap and Trade was also a large shift away from the usual Korean mindset, which sacrificed all other values for economic growth. It used to be the case that the environment was only valued insofar as it contributed to economic growth; now, it was finally going to be valued for its service. Of course, an expectation that efforts to pay for the service of nature would produce new economic opportunities was still continuing. For these reasons, the Korean government argues that the KGGI is a revolution, i.e., a paradigm shift.

Nonetheless, there is nothing in the KGGI that challenges the underlying belief of the current paradigm that the market is key for ushering in prosperity and development. Also, there was no deviation from the belief that the main driver of GG has to be the same big conglomerates that occupy the same privileged place in the present paradigm. More specifically, the KGGI is founded on the conventional economic wisdom that climate change is an externality caused by the absence of property rights, making market pricing and emissions trading possible. Market-based

solutions and the privatization of the atmosphere were still believed to be effective in resolving environmental concerns. As Interviewee 12 states, Cap and Trade is the surest way to reduce the targeted quantity of CO₂ emissions in the short term. However, this outcome is only the case when all assumptions related to achieving the target operate ideally, like in an economic textbook, as Dryzek explains.

Proposals for economic instruments can never enter in the clean and straightforward fashion of the economic textbooks. Instead, their entry and so their design is heavily dependent on the configuration of political forces and the prevailing political-economic context (2013, p.139).

Reality is often twisted by unexpected events and the intervention of interested parties, as already demonstrated through previous attempts at a carbon market in Europe and Australia. Expected messes from the commercialization of the environment will be discussed in detail in chapter 8. In this chapter, the power of business, which distorts market-based climate policies, is examined.

8.3 Businesses: The Winner of the Politics Surrounding the Introduction of the Korean Cap and Trade System

8.3.1 Retreat from the Initial Cap and Trade Plan

The dynamics in the introductory process of two policy programs, Cap and Trade, and Automobile Subsidy and Levy¹³, demonstrate that the political economic

¹³ According to the Basic Act on Green Growth of Korea, this program specifies that the government take measures for improving financial support for people who purchase an automobile emitting less greenhouse gases, while imposing a charge on people who purchase automobiles emitting more greenhouse gases. Similar programs are operated in France and Canada. They are called respectively as 'Bonus-Malus' in France and 'ecoAuto' in Canada.

structure heavily influences the arrangement of policy programs. Building the Korean emission trading system faced a big challenge from the alliance of industry and economic affairs bureaucrats. Despite its market friendly attributes and focus on economic efficiency, the programs of the KGGI faced strong resistance from industry. Even inside the government, the resistance to the regulation of externalities caused by greenhouse gases was tenacious. Lee, this author, served as a Director General for the Department of General Affairs at Green Growth Committee and describes this challenge as follows:

Surrounding the introduction of the emission trading system, the conflict was severe among related government departments. Thus, xxx and I, who were in the neutral stance in the midst of conflicts among government departments could not help but doing the leading role in the creating the emission trading system. On December 7, 2010 when it was the last day I worked at the Presidential Office, I visited the office of the Secretary to the President for Knowledge Economy with the Senior Secretary to the President for Green Growth xxx and had a heated discussion with Secretary xxx and Director General xxx of the Knowledge Economy Secretary Office. They were arguing that the enforcement date of the Act on Emission Trading System could be flexibly adjusted according to the business environment and situation of international talk. For that, they maintained, the enforcement date had to be stipulated in the addenda of the act with a vague expression. We confronted them with the argument that it could not be accepted both from the aspect of the legislative logic and for the effectiveness of policy (2013, p. vii).

It seems that the opposition from inside of the government, especially bureaucrats bolstering the interest of industry, formed the base of the resistance combined with the business lobby. Builders of the emission trading system had to encounter opposition from inside as well as outside. The resistance group has had a strong influence in both the political and economic arenas. It meant that they had enough power to defeat the policy program and prevent it from being enacted, or, even

if it was institutionalized, they had the power to ensure the policy did not achieve its intended effects. Businesses utilized all means that they could mobilize to block the policy, including official methods such as filing joint petitions of industry alliances and economic organizations, and holding seminars to promote their opposing stance. Official protests were strongly supported by the unofficial business lobby, which is more powerful than the official one. They contacted the highest level of politicians and decision-makers in the government and appealed to them by pointing to the damages that would be caused by the emission trading system. They did not admit that their goal was to avoid the costs of having to internalize the externality generated by their businesses. Instead, they stressed it was the strong regulation that would threaten their competitiveness over their international rivals. Inside the government, the economic affairs departments that were responsible for the macro economic performance of national economy and economic growth rate had a solid alliance with industries and responded to their appeals. In the Korean situation in which the conclusion of cabinet meetings is based on the unanimity principle, the opposition of economic affairs ministries exerted a large pressure on the architects of the emission trading system. Interviewee 5, who led the creation of emission trading system, spoke out on the question of why the Korean emission trading system was too business friendly for the trading market to work well as follows:

Our aim was, most of all, to open the emission trading market. We believed that once the market opened, whatever expected problems really happened to be, it would be figured out at that time. We could not help but embracing the claims of businesses in the design of the system.

As a result, resistance by the alliance of business and economic bureaucrats had a considerable impact on the final policy. Their victory is evident when comparing

the pre-announcement of legislation, the joint petition of industry associations, and the final act. The lobby of industry alliances and five major business associations¹⁴ executed their attack in two phases. The first phase occurred during the creation of the bill on the Allocation and Trading of Greenhouse-Gas Permits. Business devoted all its energy to changing key provisions to suit its interest. At this moment, they did not try to defeat the program, as it was clear this strategy would backfire because it was an iconic program of the KGGI, which was the core Presidential agenda. Table 8.1 shows how the bill was transformed by the influence of business. As seen from the Table 8.1, most of the key provisions were modified as business proposed.

The government tried to seek points of compromise in many issues. For example, the wide range of flexibility mechanisms was allowed in the Korean emissions trading scheme to pacify unhappy business. Lee (2013), this author and a leading builder of the law, expressed concerns that the flexibility mechanisms were too adjustable for the emissions trading system to make reductions really happen. He added that the flexibility mechanisms had to allow for a few exceptional cases that were unpredictable.

In addition, the enforcement of the emission trading system was put off from January 1, 2013 until January 1, 2015, after a new administration would come into power. The delay of enforcement could give business two opportunities. One was that businesses could have time to prepare for the new system and avoid paying costs from

¹⁴ These include 5 major business associations; The Federation of Korean Industries, The Korea Chamber of Commerce and Industry, Korea International Trade Association, Korea Employers Federation, Korea Federation of Small and Medium Business, and 19 associations by industry such as Korea Iron and Steel Association, Korea Automobile Manufactures Association, Korea Petroleum Association, etc.

the new system for two years. The other, which seems more critical to business, was to have another compromise chance with a new government, which had a high possibility of being unhappy with the former regime’s core agenda. Business seemed to expect that the policy would fizzle out when a new power came in. This hope can be observed from the interview with a high-ranking member of the Federation of Korean Industries. As Interviewee 16 says,

When the bill of the emission trading system was being created in 2011, only few big companies and industry alliances were active in making their voice. It was true that most business entities expected that the system would not really work despite the institutionalization of the system.

Table 8.1: Issues on Development of the Final Act

	Bill (Pre-announcement of legislation)	Petition by Industry and Trade Associations	Final Act
Enforcement Date	Jan-01-2013	Jan-01-2015	Jan-01-2015
Exceptional cases for Addressing Greenhouse-gas Leakage and Competitiveness Issues	None	Proposed to add exceptions for industries sensitive to CO ₂ leakage and high trade-intensive industries.	Financial support and tax relief for the installation of greenhouse-gas reduction facilities and related technology research and development. Application of 100% grandfathering for industries susceptible to trade and greenhouse-gas leakage, etc.

	Bill (Pre-announcement of legislation)	Petition by Industry and Trade Associations	Final Act
Allocation of Compliance Permits	First Commitment Period: 90% applicable to grandfathering rule, 10% auction Third Commitment Period: 100% auction	Proposed application of 100% grandfathering rule	First commitment period: 100% applicable to grandfathering rule Second commitment period: 97% applicable to grandfathering rule, 3% auction Third period and After: less than 90% applicable to grandfathering rule
Possibility of change in allocation of compliance permits	Allow change in annual compliance permits within each commitment period	Proposed to allow change in gross total compliance permits for each commitment period along with change in annual compliance permits	Possibility of change in allocation of compliance permits

	Bill (Pre-announcement of legislation)	Petition by Industry and Trade Associations	Final Act
Flexibility Mechanism	<p>Allowed banking of compliance permits for the following compliance year</p> <p>Comprehensive provision of limits to allowed amount of emission offset</p> <p>Extra allocation of compliance permits according to the officially verified emission reduction record before the enforcement of the Korean greenhouse-gas and energy target management system</p>	<p>Proposed to allow banking of compliance permits for the following compliance year and commitment period</p> <p>Proposed no limit to allowed amount of emission offset</p> <p>Proposed to extra allocation of compliance permits according to the officially verified emission reduction record before the Korean greenhouse-gas and energy target management system and the excess performance under the target management system</p>	<p>Allow banking of compliance permits for the following compliance year and for the first year of the following commitment period</p> <p>Emission offset compliance allowed up to 10/100 over the allocated compliance permits</p> <p>Extra allocation of compliance permits up to 2.5/100 of total permits allocated during the first commitment period according to the officially verified emission reduction record before the Korean greenhouse-gas and energy target management system and the excess performance under the target management system</p>

	Bill (Pre-announcement of legislation)	Petition by Industry and Trade Associations	Final Act
Post Adjustment of Permits Allocation	None	Proposed to make adjustments to the compliance allocation according to the change in production due to unexpected establishment or expansion of facilities and etc.	Allow adjustment of compliance permit allocation due to unexpected establishment or expansion of facilities, change in the range of products, revision to the business plan, or other cause of event to change emission outputs
Participants of the Emission Trading Market	Business entities subject to the allocation of compliance permits Citizens and juridical persons Citizens and juridical persons of other countries in agreement of reciprocal emission trading with Korean government	Proposed to restrict to business entities only	Restrict to business entities during the first commitment period Open market to participants in all categories from the third commitment period
Penalty and Fine for failure to meet the compliance target	Penalty: up to 5 times the average market price and \$1,000 per ton of CO ₂ for shortage amount Fine: up to \$50,000	Penalty: up to 3 times the average market price and \$20 per ton of CO ₂ for shortage amount Fine: up to \$10,000	Penalty: up to 3 times the average market price and \$100 per ton of CO ₂ for shortage amount Fine: up to \$10,000

In December 2013, one year ahead of the trading system's enforcement, the business lobby resumed its activities again with serious determination. At this time, the allocation of compliance permits was on track. The voice of business became stronger than at the first stage of legislation, and the alliance inside business became solid. The aim of lobby at this time was to actually kill the policy, which was supported by an interview with an employee of the Federation of Korean Industries. As this person mentions,

Now, all businesses began to realize that the policy really would happen because the allocation of permits was visualized with the shortage of permits than they needed. It was a money issue and urgent to businesses. All related business entities made a strong bond and took a firm stand against the government (Interviewee 16).

In this context, the business lobby issued three joint petitions with the final one in June 2014. In their second petition in December 2013, business demanded that the enforcement of the emission trading system be delayed to 2020, when a new climate regime replacing the Kyoto regime would launch, with the justification being the collapse of the Kyoto regime. COP19 in November 2013 in Warsaw failed to draw a 2015 agreement. Russia, Japan, Canada, and New Zealand refused to remain in the Kyoto regime during the second commitment period, which was supposed to be effective starting in 2015. The trend of instability surrounding international climate talks formed a good pretext for business to retreat from the emission trading system. If competing countries would not comply with the strict emissions reduction target, business argued, Korea did not need to create a new climate policy that harmed nation's industrial competitiveness. Business also claimed the decrease in the emission reductions target and the increase of emissions projection under BAU. It argued that the reduction of nuclear generation as stated in the National Energy Plan and the

failure of government policy to diversify energy sources would make CO₂ emissions rise. The other two petitions came out in June 2014. One was to re-examine the draft of the permit allocation plan. Business raised 3 issues in this petition: first, they argued that BAU projections should be modified to consider the changed economic environment and that total compliance permits and permits by industry should be revised based on the modified BAU, second, they lobbied to exclude indirect emissions from the trading scheme, and third, they implored the government to hold off on deciding the permit allocation plan until after there was more discussion with related stakeholders.

8.3.2 The Block of the Automobile Subsidy and Levy Program

The final petition came from five major business associations and alliances related to automobile manufacture, who asked for the withdrawal of the Automobile Subsidy and Levy program. This program was one of key programs targeting CO₂ emissions reductions in the KGGI. It was six months ahead of enforcement at that time. The automobile industry used the rationale that this program would only benefit German and Japanese automobile makers. They argued that it would be against the competitiveness of the domestic auto industry and provide a good business environment for giant foreign corporations.

As the resistance of industry heated up, the press threw out related reports backing this opposition. This was also the result of the industry's appeal to the press. Press releases, echoing business's voice discussed topics intended to cast doubt on the authorities behind permits allocation and the Automobile Subsidy and Levy program, specifically the Ministry of Environment. Those reports focused on the potential

damages to domestic industries and the lack of preparation for the enforcement of policy. The titles of the reports are as Table 8.2.

Table 8.2: News Reports Addressed by Authority over Permits Allocation

Date	Media	Title
June-02-2014	The Dong-A Daily News	Penalty for Shortage of Permits will be over \$28 Billion. Serious Damage on Domestic Industries
June-11-2014	The Chosun Ilbo	Business, Excessive CO2 Emission Reduction Target... Maximum \$28 Billion Added Burden
Aug-05-2014	Seoul Business Daily	Exchange with No Comprehensive Investigation Rights, Helpless against Price Manipulation Greenhouse-gas Emission Trading System Coming up 4 Months Ahead.... No Device to Prevent Market Disturbance
Aug-11-2014	Maeil Business Newspaper	Greenhouse-gas Emission Trading System is Going to Drive the Exodus of Business from Korea
Nov-28-2014	Seoul Business Daily	Greenhouse-gas Emission Trading System, Set a Tax Bomb

The new economic affairs team started with the newly appointed deputy prime minister for economic affairs showing a sensitive response to business's appeal. The government's approach to the emission trading system and Automobile Subsidy and Levy notably turned business friendly from this point. It is evident that business played an important role in changing the government's response, in that the core agenda of government converged on the revitalization of economy around that time. This change was reflected in the remarks of the Minister of Economy with regard to climate related policies in July 2014, as illustrated in Table 8.3.

Table 8.3: Remarks of Minister of Economy on Emission Trading System and Automobile Subsidy and Levy

Date	Remarks
July-07-2014	<p>Related to the enforcement of Automobile Subsidy and Levy, it is required to comprehensively consider the possibility of burden on low-income families and damage on industrial competitiveness, and international trend, etc.</p> <p>Government will review all possibilities including the relief of burden on business so that the greenhouse-gas emission trading system will harmonize well with our circumstance.</p>
July-16-2014	<p>Government is going to meticulously re-examine problems and readiness for the enforcement, and then set the direction of emission trading system. If it is needed, government is going to have a talk with national assembly.</p>
July-17-2014	<p>If it is concluded that the enforcement of emission trading system is not ready enough, it is needed to complement related legislation.</p>
July-28-2014	<p>There exist many voices of concerns related to the enforcement of emission trading system and Automobile Subsidy and Levy in January 1, 2015.</p>

Source: Park. (The Munhwa Ilbo, Aug 14, 2014).

During the process, there seemed to be conflicts among ministries. The Automobile Subsidy and Levy was especially vulnerable to attacks because it was less symbolic than the Cap and Trade in both the domestic and international arenas. Interviewees commonly said that the purpose of the Cap and Trade was to declare a core platform toward reducing carbon emissions to show the strong will of Korea in the international climate politics arena. Consequently, it was not easy for the Korean government to break the promise. However, the Automobile Subsidy and Levy was different. There was no big barrier to prevent sacrificing the Automobile Subsidy and

Levy to satisfy business. According to a report of Munhwa Ilbo on August 14, 2014, Ministry of Environment (MOE), which has authority over permits allocation and the Automobile Subsidy and Levy, has looked for a way to drive the enforcement of both policies as they were scheduled. In the case of the Automobile Subsidy and Levy, the Ministry of Environment considered a compromise. It contemplated changing the scheme of program by way of reducing the burden on automakers, which was to lower the levy from up to \$4,000 to up to \$2,000 and the subsidy from up to \$1,000 to up to \$500. On the other hand, core economic ministries, namely, the Ministry of Strategy and Finance (MOSF) and the Ministry of Trade, Industry and Energy (MOTIE) were highly skeptical of the program. The report of Munhwa Ilbo wrote that two economic ministries were thinking of conducting a close examination of its cost-effectiveness. Also, they argued that it would be better to hold off the enforcement of the policy rather than pushing into it. They mirrored the same argument as automakers that the program would only harm the competitiveness of domestic auto manufactures with no clear impact on CO₂ reduction. The report added that MOE and the alliance of MOSF and MOTIE had been fighting over the Automobile Subsidy and Levy.

Finally, the Korean government concluded the policy drafting process over related controversies inside government at the 30th Economic Ministerial Meeting on September 20, 2014. The result was a significant retreat from the original design of the plan. The greenhouse gas reduction target was lowered by 10% throughout all industries. The indirect emissions and generation sector were given more favors with the justification that they would bear comparatively more of the burden than other industries. Also, the government decided to re-examine the prospect of BAU 2015-2020 to make the program better reflect the realities surrounding the business

environment, or so it was explained. As already expected, the enforcement of the Automobile Subsidy and Levy was put off until January 1, 2021. Instead, the government presented a variety of supporting plans for the automobile manufacture industry. Table 8.4 provides a description of government support plans.

Table 8.4: Final Decision of the Government on the Korean Emission Trading System and Automobile Subsidy and Levy Controversy

Emission Trading System	Automobile Subsidy and Levy
<p>Lower the reduction rate of emissions by 10% throughout all industries</p> <p>Reduce the compliance targets for indirect emissions and generation sectors</p> <ul style="list-style-type: none"> - Adjust the permit allocations of two sectors according to the emissions results of 2014 and 2015 <p>Set the baseline price of permit at \$10</p> <p>Review the prospect of BAU from 2015 to 2020 in order to make the program reflect the realities surrounding the business environment</p>	<p>The enforcement was put off until January 1, 2021</p> <p>Increase the financial aid from the government for eco-friendly cars (electricity and hybrid cars)</p> <ul style="list-style-type: none"> - Increase subsidies for eco-friendly cars - Extend the period for tax cuts on eco-friendly cars <p>Strengthen the standard of fuel-efficiency and greenhouse-gas emissions to the level of developed countries by 2020</p>

8.3.3 Citizens: The Group that Bears the Burden of Market-Based Solutions

Companies were notified of their permit allocations on November 28, 2014. A total of 525 companies were subject to the emissions restriction from 2015 to 2017, the first compliance period of the emission trading system. The aggregate quota for the 525 companies was set at 1.598 billion KAU¹⁵ and 89 million tons were put aside as a

¹⁵ KAU (Korean Allowance Unit) is the name of Korean permits. 1KAU is equivalent to 1 ton CO₂.

reserve, so that the total quota reached 1.687 billion tons. In the press release to announce the emissions quota by company, the head of the taskforce team for the Korean emission trading system repeated that climate change adaptation was not a burden for business but a new growth opportunity, adding that the emission trading system is a part of 3-Year-Plan for Economic Innovation.

Business reacted against the final allocation, announcing one more joint petition. The petition aggregated all previous petitions. However, the business alliance was not as unified and strong as it was in the previous round of resistance because the winners and losers of the policy were now apparent. According to an *Energy & Environmental News* report on December 26, 2014, the most salient feature of the allocation result was that the burden of the automobile industry was minimized but this reduced burden was shifted to the electricity and energy sector. In the Korean situation, 89.4% of the nation’s electricity is generated by public facilities owned by the government¹⁶, meaning that the public sector undertook the responsibility originally intended for private companies.

Nevertheless, the electricity and energy sector was satisfied with shouldering the burden, as the government assured them that any extra cost would be transferred to the electricity price. Private power generators could benefit much more from this new plan. Usually, private power generators go into production during peak hours when the

¹⁶ Power Generation of Korea in 2013

	Power Generation (GWh)	Portion
Public Utility	428,723	89.4%
Private	50,813	10.6%
Total	479,536	100%

Source: Korea Power Exchange. (2014).

market price of electricity rises, meaning that they have a high possibility of profiting both from the effect of electricity price increases and from permit trading according to the situation of the permit market. The report also conveyed the voice of Combined Heat and Power (CHP) generation sector, which thought it had been made a scapegoat from the allocation result. In the generation and energy sector, CHP contributed 7.1% of emissions but the allocated permits were only 6.4% of the total. This, it argued, went against the international trend. Of European countries, Germany applies a coordination factor of 0.9875 and Italy and Greece apply 1 to calculate emissions quotas, whereas the factors of electricity generation are 0.85, 0.74, and 0.92 in those countries, respectively. The report added that CHP businesses in the local industry complex, which typically houses small and medium-sized businesses, were troubled by the possibility that rising electricity and heat prices could drive the leakage of small and medium businesses to other countries and damage their competitiveness. On this point, it cannot be overlooked that most of CHP generations are small and medium businesses with the exception of one public entity, Korea District Heating Corp., which has almost half of market share in this sector.

In the tug-of-war between the government and business over core climate policies, the ultimate losers were Korean citizens who are going to receive their raised utility bills soon. The small and medium businesses, which did not have enough resources to appeal to the government and power to control the market, also were the losers of the policy. The interest of citizens was sacrificed in the decision related to the Automobile Subsidy and Levy. The government changed the direction of the plan from providing financial aid, such as subsidies and tax cuts on eco-friendly cars, to utilizing the incentive system of a levy on high-emissions cars and a subsidy on low-

emissions cars. The added cost to the government, generated by the shift of plan to help big automobile businesses, cannot help but depending on taxpayer's money to cover the difference.

8.4 Unbreakable Market Power and Vested Interests

In the end, the climate policies based on market mechanisms—their purpose being to create new market opportunities and wealth without negatively impacting those who benefited from in the old system—did not lead to any change in the value system and power structure. The programs were justified under the market liberal rationale that market mechanisms would be the most efficient means of resolving the environmental problems caused by market failures; however, the actual outcomes fell far short of the expectations set by market optimists. The South Korean case makes for a good illustration of the fact that policy instruments rarely, if ever, resemble the neat examples provided in economic textbooks. The political force of big business distorted the intentions of the climate policies and determined how and to whom the benefits were to be distributed in way that secured its own advantage. This outcome was partially the fault of the paradigm that spawned these policies. The economic purpose of the programs took precedence over the environmental goals, which allowed big business, the most frequent beneficiary of government policies and main driver of the Korean economic development path, to become the winners and main agents once more even under the “new paradigm” of the KGGI.

The case of big business using its influence to craft policy according to its likening is not unique to Korea, but has been observed elsewhere as well. According to Galbraith (Spash, 2010), modern economic players are divided into two groups. One is made up of small producers who lack power and are always subject to fierce

competition among themselves. The other is composed of large producers who are more unified and possess considerable power through their close relationships with politicians and regulators. Aside from Korea, Galbraithian conditions have been also observed in the climate politics in the United States, where big businesses in the late 1990s spent upwards of USD 100 million to fight against the Kyoto Protocol (Grubb, Vrolijk, & Brack, 1999, cited in Spash, 2010). Moreover, many of the economic studies deemphasizing climate change damages and accentuating mitigation costs have been funded by dominant interests; e.g., U.S. electric power generators (Chapman & Khanna, 2000, cited in Spash, 2010).

On the other hand, there are also cases where it has been in the self-interest of big business to support a permit trading system. For instance, the German power company RWE supported the country's cap and trade scheme because it foresaw the potential of massive financial returns. The returns were estimated to be USD 6.4 billion in the first three years of the system (Kantner, 2008, cited in Spash, 2010), and another €1.8 billion was expected to be made in one year by selling grandfathered permits (Lohmann, 2006, cited in Spash, 2010). Spash argued that the once-proposed Australian permit-trading scheme is characteristically Galbraithian in that it proposed "large polluters be 'compensated' with free permits while the smaller more numerous competitive fringe face buying theirs at auction" (2010, p. 14).

Accordingly, it can be concluded that a paradigm shift is not easy to occur in a political economy that does not block vested interests from unjustly exerting their power nor allows for big business to seek continued economic expansion.

Nonetheless, if the Korean permit trading scheme can be successfully implemented and integrated into the country's energy and economic policy structure,

it could be an efficient tool for reducing CO₂ emissions as well as a sign that GG has succeeded in achieving a policy shift. However, this outcome does not seem very likely as the Korean permit trading system received a poor report card at the one-year anniversary of its enforcement. The total volume of traded GHGs for one year represented only 0.8% of the total permits allocated, which program insiders have blamed on the permit rates being set too low (Im, December 16, 2015). This initial finding increases the probability that GG will fail to have initiated a policy shift.

Chapter 9

CAPITALIZED NATURE VERSUS THE KGGI'S INTENTIONS FOR ENVIRONMENT-SOCIETY RELATIONS

Chapter 9 probes the underlying perception of nature that is embedded in the KGGI. Section 4.3 of chapter 4 discussed how humanity was able to obtain mastery over nature in the PP through the techniques of governmentality, artificiality, and commodification of nature. Repairing the relationship between humans and nature is the main goal of GG; thus, it is crucial that the paradigm analysis conducted in this study examine whether actual GG projects are attempting to realize a less dominating attitude toward nature.. As such, the research in this chapter centers on investigating whether the KGGI's 4 Rivers Restoration Project and Korean Permit Trading Scheme show evidence of an attempt at bettering the environment-society relationship. If it concluded that the major projects of the KGGI still adhere to the tenet of human mastery over nature, then GG cannot be viewed as a cure for the ecological crises and inequality engendered by the political ecology of the PP.

9.1 History of Korean Environmental Perspectives and Policy

9.1.1 Changes in the Environment-Society Relationship

While the Western world experienced a separation between humans and nature from the early modern period onward, humans in the Eastern world remained attached to nature as an organic whole until a comparatively recent time. For Korea, the destructive exploitation of nature began when the country was colonized by Japan.

Prior to that, Korean culture held respect for nature as a delicate and enormous being under the strong spiritual influence of Taoism. Moreover, Koreans did not believe they could unravel the mystery of nature with humanity's finite logic and reason.

According to Moon:

Koreans' everyday life culture had been basically ecological, in which people recycled almost resources and pollution was minimized. Citizens rarely generated waste from their everyday living. Foreigners, who lived in Korea in the late 19th century, had difficulty in treating garbage because there was no garbage service offered by the government. Food waste was utilized as feedstuff and, ashes and night soils were recycled as manure compost for fertilizing fields. Stones and soils became host materials for house construction with wood to minimize logging... The government policy related to environment was very strict. It is shown in the rule of 'SongMokGeumBeol (松木禁伐)¹⁷', which was a general rule applied throughout Chosun Dynasty. Also, people who carelessly threw away manure and waste were heavily punished for squandering valuable resources and contaminating the environment (2008, P.132).

This strict protection of resources found its origin in the reverence for nature. However, when the country passed through the period of Japanese colonization and industrial development following the Korean War, the relationship between humanity and nature shifted in a completely different direction. Nature was subject to exploitation and valued only for its usefulness in satisfying human interests. Japan, a hostile capitalist state that fought with Western states over global markets and new territories, subjugated Korea's natural world to fuel its greedy desires. Natural resources such as agricultural land, rivers, and forests were mobilized and

¹⁷ Under this rule, people who committed illegal logging were subjected to a heavy penalty. Government officials who had supervisory responsibilities over the forest were also punished for neglecting their duty.

overexploited by the Japanese in their aggressive wars. Koreans themselves also came to mirror these practices. The industrial development that took place after the Korean War marked a cultural turning point in which Koreans began to exercise mastery over the natural world and overexploit its materials. As a result, the symbols of early industrial cities—smog, filthy streams, bad water quality, and stinky slums—were reproduced in Korea. Seoul, with its newly gray atmosphere, became a clone of the industrial-era cities Manchester and Pittsburg in the 1970s and 1980s.

As the Kuznets theorem¹⁸ suggests, South Korea has made a considerable effort to ameliorate its polluted environments as its economic accomplishments came closer to those of the developed countries. The motive for addressing pollution came mainly from two sources. One was the international pressure and trends that further stressed the importance of environmental stewardship in economic development. The Rio conference in 2002 and Korea's entry into the OECD contributed greatly to the growing momentum for the environmental movement. Domestic public environmental sentiment was also growing rapidly in the 1990s, and there were several civil movements. In July 1990, Korea enacted six primary environmental laws, Framework Act on Environmental Policy, Clean Air Conservation Act, Water Quality

¹⁸ There have been manifold disputes over whether the Kuznets theorem is generally applicable to all countries. Korea is often viewed as an exceptional country that has successfully joined the rich club by the occidental economic development path, in which the environment became markedly cleaner by exporting First World pollution facilities to the Third World. Despite this trend, Korea's CO₂ emissions continue to grow and the country is contributing considerably to climate change. The OECD (2006) pointed out that, despite significant progress in atmospheric quality, sewage treatment, and waste management, Korea still must improve its biodiversity conservation, landscape conservation, land usage, city planning, energy efficiency, and efficient resource use.

Conservation Act, Environmental Disputes Adjustment Act, Noise and Vibration Control Act, and Toxic Chemicals Control Act, to replace the era when there was a single environmental law governing the country. The enactment of Framework Act on Sustainable Development and the elevation of the Environmental Office to the level of ministry in the 2000s indicate the significant change that has taken place regarding the position and dimension of environmental policies in Korea. Despite these changes, however, environmental policies remain marginal in terms of political importance. During situations in which the value of economic growth overpowers social and cultural values, the environment often is sacrificed.

9.1.2 Is the KGGI a Paradigm Shift for Nature?

The GG Initiative of the Lee administration marked a significant historical milestone in that environmental policy emerged as a key priority of the government for the first time. According to the government, the Korean Green Growth Initiative (KGGI) sought a new development path compatible with both environmental protection and economic growth. It was expected that this policy would spawn new growth engines and business actions to protect the environment. Also, the government showed that advanced technologies could be applied to make this goal a reality.

Interviewee 4's statement makes for a clear illustration:

We should not leave the environment and economic growth conflicting and exclusive each other. Let's create a new paradigm of Green Growth, which pursues economic growth and environmental protection actively applying state of the art technologies.

According to the strategy of GG, the environment is not perceived as an obstacle that has to be overcome but rather as a vehicle for advancing human progress. Furthermore, nature is elevated to an object worthy of protection, not exploitation,

under this paradigm. But while this is clearly a departure from the modern perspective of the environment, one might still ask whether this shift in how the environment is viewed constitutes a paradigm shift. In other words, does this perspective really make it possible for humanity and nature to be commensurable? If there is no change in the belief system concerning how nature is perceived, then it must not be concluded that there has been a paradigm shift. Also, if the power structure keeps the status quo the same, namely, the winners are still winners, no fundamental change can be expected. As discussed in Section 4.4, the modern relationship between humanity and nature is characterized by governmentality, artificiality, and commodification. These three characteristics underline the human-nature relationship and form the base of the power structure derived from it. This section analyzes the KGGI from the standpoint of these three characteristics.

9.2 Probing ‘the 4 Rivers Restoration Project’ through the perspective of Governmentality and Artificiality

9.2.1 The 4 Rivers Project: Echoing the Promise of the Development Economy

The 4 Rivers Restoration Project is the beginning and end project of the KGGI. Some Korean critics say that the KGGI exists merely as propaganda to legitimize the 4 Rivers Project, illustrating the project’s controversial nature. Even some people who share the same faction as President Lee and his successor President Park wanted to veto this project. Needless to say, the project also encountered strong resistance from opposing parties and civil society (Choi, 2012). Nevertheless, the will of President Lee was firm on pushing it forward. To break through the myriad of difficulties and institutional obstacles associated with the project, the Lee administration mobilized all available resources and means, including tricks to evade related environmental and

public financial regulations. The commencement of the project, which took place before the advance environmental assessment had concluded, caused a tremendous stir. Also, the bypassing of the preliminary feasibility study ensured that the project would continue to be subject to criticism. As a means of dispensing with the public's concern over the huge financial cost of the project, the government utilized public corporations for funding and a significant portion of total investment was taken over by the Korea Water Resources Corporation (K-water)¹⁹. Yet despite these mollifying measures, citizens remained concerned that the project would be an environmental catastrophe in addition to a black hole devouring resources intended for other sectors, such as social welfare, education, agriculture, and so on.

In spite of the strong social resistance and political risk, President Lee remained firmly committed to the project because he was convinced of benefits it would bring. The belief seems to be formed from his experience when he joined the Gyeongbu Expressway²⁰ project as a young employee of the Hyundai Construction

¹⁹ The Korean government decided to make K-water the key partner of the project at the National Policy Coordination Meeting held in September 25, 2009. K-Water came to take over the costs of USD 8 billion of out of a total project cost of USD 22 billion. The government promised to fully cover the financial cost of the project and fund any deficits. It was also added that the financial support plan would be discussed and specified in detail at the completion stage of the project. During 2010-2014, the financial status of K-Water has seriously worsened. As of October 2014, the liability size of K-water reached a seven-fold increase compared to 2008.

²⁰ The Gyeongbu Expressway, which commenced construction in 1968, was planned to be the main artery of Korea, connecting Seoul to the major cities of Suwon, Daejeon, Daegu, and Busan. Support for this project came from the strong aspirations of President Park Jeong-Hee to construct the basic infrastructure necessary for the industrialization of the state. Opposition to the expressway construction came from inside the government as well as from the opposite party, academia, and the press. International organizations such as IBRD and ADB declined the President's loan

Co., which carried out the construction. He wrote about the experience in his memoirs, published in January 2015, as follows:

The Gyeongbu Express continued to be subject to criticisms. Yet, there is no one to blame the decision to build the express now. No one can deny that the Gyeongbu express made a great contribution to the industrialization of country and it possible to reach any place in the country in a day's trip... Those people who opposed to every single major national project are criticizing the 4 Rivers Project" (2015, p. 28).

Unlike other major KGGI programs, the 4 Rivers Project initiated by President Lee had been incubating since before the president took office. This initiative has its origin in President Lee's ambitious dream project, the Pan Korea Grand Waterway, which he pledged to create during the 2007 presidential election. Despite his enthusiasm, however, the plan faced vehement objections from the public to the point that his attempts to push the policy succeeded only in eroding the bedrock of his political base. Hence, the 4 Rivers Project was a compromise between his dream and public sentiment. According to his radio speech on June 29, 2009, there was no change in the President's belief that the grand waterway was a promising project even after it was officially cancelled. He said that he had conceived the grand waterway from his days as a businessman at the Hyundai Construction Co. and proposed it as a government project in 1996 as a member of parliament. During his office as the mayor of the city of Seoul, his ideas came into being as the Cheonggye Stream Restoration project. The goal was to artificially reproduce the old Cheonggye stream, which has been covered with concrete in the 1970s. Managing the artificial stream in the heart of Seoul provided a means of showing off President Lee's commitment to advanced

requests for the project, citing a lack of economic feasibility. However, President Park forced this project to be undertaken through his authoritarian power.

technology and modern administrative skill. The restored stream ultimately became a hotspot that attracted domestic and foreign tourists and thus stimulated the economic rejuvenation of adjacent business districts. Lee gained considerable success and respect as a leading politician following the Cheonggye Stream Restoration project. Many attribute his victory in the 2007 presidential election to the project's success.

The 4 Rivers Project is not much different from the Pan Korea Waterway Plan, aside from its ambitious goal to connect the Han and Nakdong Rivers by flooding a mountaintop tunnel. Cargo freighters would sail from Korea's second largest harbor city Pusan to the capital city Seoul through the connected waterway. The project is a grand landscape remodeling plan that involves the country's four major rivers: the Han, Nakdong, Geum, and Youngsan, as well as their neighboring areas, which encompass almost the entire inland space in the southern part of the Korean peninsula. The project included building 16 new dams, renovating 87 old dams, reinforcing 209 miles of riverbanks, dredging 570 million cubic meters of sediment for 428 river miles, and creating manifold waterfront development plans for leisure and tourism, which added an unprecedented amount of artificial structure in a very short time period to the over 18,000 dams already existing in the country's rivers and streams. The project attempted to restore the Han, Nakdong, Geum, and Youngsan Rivers and improve water security and flood control while also enhancing ecosystem vitality through this initiative. Further benefits expected from the project included the creation of new jobs and economic growth. Figure 9.1 summarizes the targets and objectives of the project drawn from diverse government documents. These targets and objectives highlight the rudimentary purpose of the project. Despite the myriad of rhetorical inventions that would seek to disguise it, the project's purpose is clearly economic.

Ecological restoration, one of the project's three pillars, is not pursued for the sake of changing the relationship between humans and nature but rather for improving the economic usage of waterways to boost tourism. In other words, the KGGI presents a paradigm shift only in the context of reconciling environmental objectives with economic growth; its restoration ecology aspect seen as a tool for business, nothing more. The fundamental objective of the project and personal background of President Lee provide sufficient evidence for the view that the 4 Rivers Restoration Project is a 21st century version of the 20th century Gyeongbu Express Project. The only difference between them is that the 4 Rivers Project hides much of its true purpose under a veneer of ecological concern.

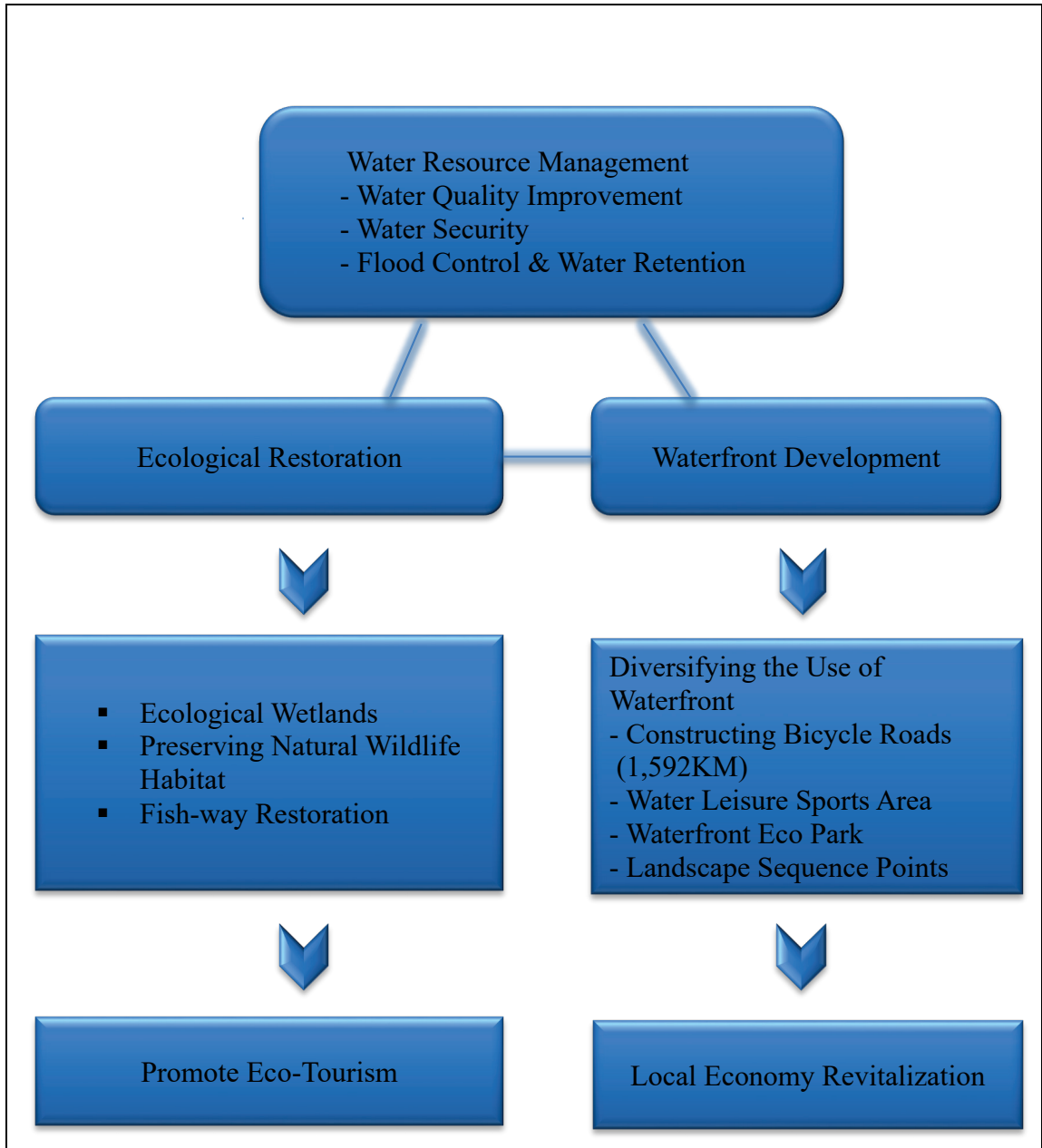


Figure 9.1: Targets and Objectives of the 4 Rivers Restoration Project.

9.2.2 Artificiality and Governmentality in the 4 Rivers Project

As discussed in Section 4.4, artificiality and governmentality are two universal characteristics of the modern human-nature relationship. Governmentality pursues regularity by placing nature under human governance to serve humanity's continued usage. In the contemporary sense that affluence is considered the ultimate social value, the level of governmentalization implemented as a means of achieving this given end becomes the yardstick for social advancement. Nature becomes a core object of governmentality for human progress. Progress in industrial societies is obtained by governing nature through human knowledge and state administration. The main avenue for securing governmentality is by injecting artificiality into nature. Human knowledge, especially technology, designs, and processes, transforms nature into more efficient and convenient forms for governing. In other words, nature becomes little more than an artifact of humanity. Artificialized nature comes to be subjected to perpetual artificiality and heightened management efforts to sustain it (Latour, 2012).

The 4 Rivers Restoration Project reflects the concepts of governmentality and the artificiality of nature being used in action. Korean Rivers were transformed into completely different shapes during the industrialization period. Before the 4 Rivers Project, the Han River, its lower stretch flowing across the capital city Seoul, had previously been artificialized with ten dams and covered with concrete on its bankside. The river was made to supply electricity, water, sand, and stones for constructing the industrialized state, and also served as a large receptacle for sewage from industrial facilities. Other Korean rivers were utilized and governed similarly. A paradigm shift could be said to have taken place in this case if artificiality was reduced and nature was given the opportunity to sustain itself through self-purification. However, the 4 River project chose instead to reinforce the artificiality and governmentality that began

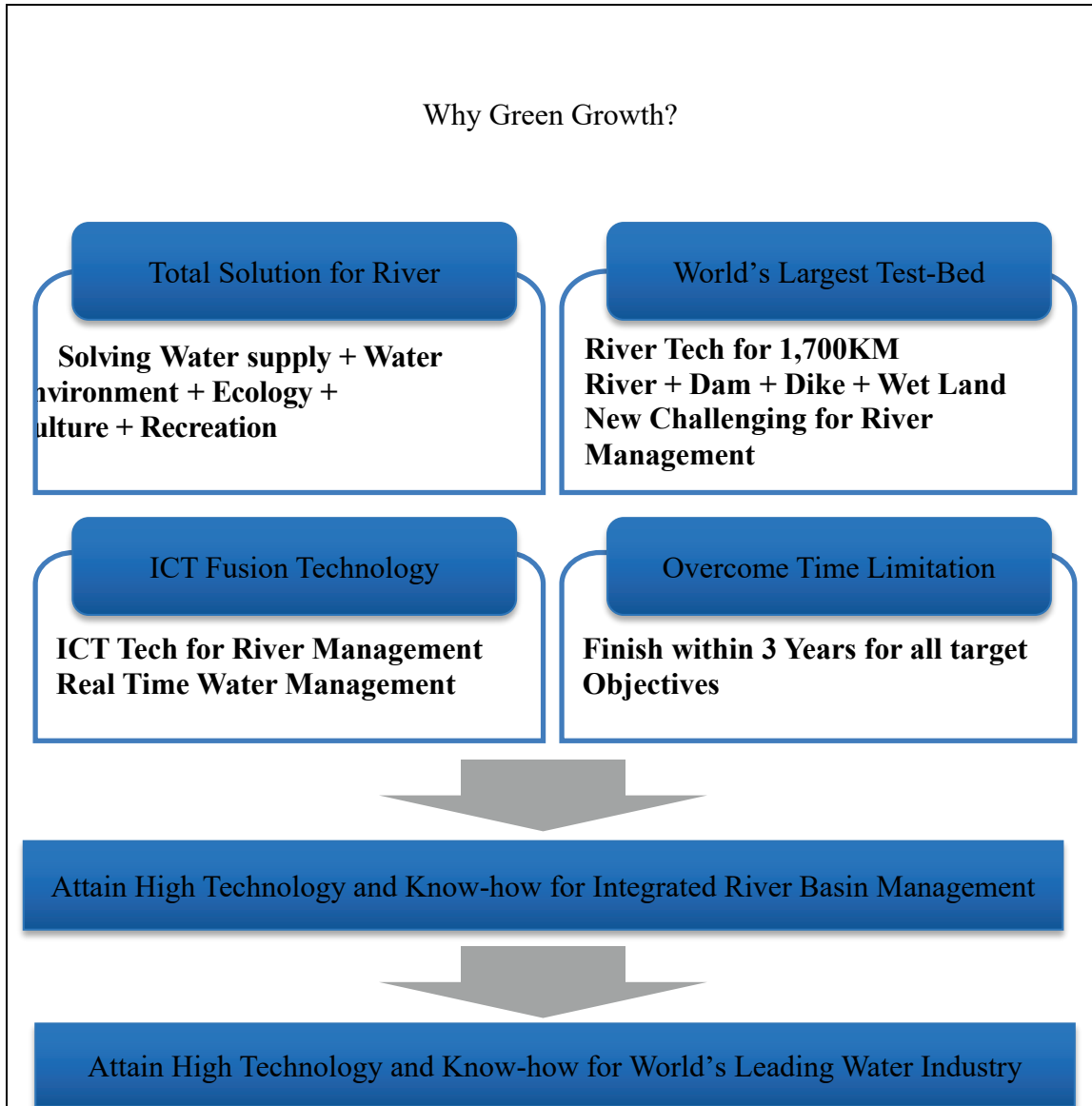
during Korea’s industrialization stage. The final goal of the project was to grow the economy rather than to recover the commensurability of humanity and nature. In other words, Korean mastery over nature became intensified as a result of this project. The evidence in support of this argument is ubiquitous. Table 9.1 summarizes remarks on the project made by high-level Korean government officials. The remarks highlight the different perceptions the project promoters have toward nature and the implications this has for the human-nature relationship.

Table 9.1: Remarks of the Related Government Officials on the 4 Rivers Restoration Project

Speakers	Remarks
<p>Former President Lee Myung-Bak</p>	<p>If value is added to the rivers by improving water quality, restoring the ecological environment, and being inspired by the local culture, we can expect much higher returns than the investment to the Project (June 29, 2009, from the 18th radio speech of the President Lee).</p> <p>We should not leave the rivers as they are, because they are one of the most useful resources of the 21st century (June 29, 2009, from the 18th radio speech of the President Lee).</p> <p>The scale of the 4 River Project was as huge, as it was called the biggest construction in the Korean history (Lee, 2015, p. 563).</p> <p>The world-class construction technology of Korean companies and the advanced current civil engineering technology made it possible for that huge construction plan to be completed in just 3 years (Lee, 2015, p. 564).</p> <p>The 4 Rivers Project aroused an echo in the international community as a model program of the Green New Deal. It was a strategy to overcome the financial crisis of 2008 through treasury investment in the environment like President</p>

Speakers	Remarks
	[Roosevelt’s] New Deal, which was utilized to surmount the Great Depression with fiscal policies such as the Tennessee River Valley Development Project (Lee, 2015, p. 564).
Former Special Advisor to the President Kang Man-Soo	The 4 Rivers Project is not a simple flood-control work. It is a grand industry initiative to generate new investments in hotels, leisure, tourism, etc. (February 16, 2011, at the special lecture hosted by the Korea Employers Federation).
Former Minister of Environment Lee Man-Ui	If construction know-how and information technology were not mature, the 4 Rivers Project could not be realized. With the state of the art green technology, we could control the processes of the construction and related issues. It has a great implication that the President Lee emphasized the 4 Rivers project as the rebirth project not the simple improvement project of the rivers (December 24, 2008, at the News Show of Kim Hyun-Jung, CBS).

According to a presentation made by a representative of the Korean government at the International UN-Water Conference held in Zaragoza, Spain in 2011 (Figure 9.2), the 4 Rivers project was being introduced as a test-bed to develop new green technology that would improve river management.



Source: Office of National River Restoration Korea. (2011).

Figure 9.2: Why is the 4 Rivers Project Green Growth?

From the above remarks and presentation, one can easily assume that the government still adheres to the prevailing concept that nature can be controlled and

manipulated by human knowledge. The belief that nature only has value insofar as it can be used by humanity remains strongly implicit in the policy, as well as in the social institutional structure, despite the KGGI's claim that the project was helping to replace environmental exploitation with the protection of nature. Rather, the promotion of the project reveals that confidence in governmentality and artificiality became intensified. Korean citizens still express their concerns about the effects of the project, particularly, the environmental aftermath that may last beyond this generation. Despite the Lee administration's argument that the 4 Rivers Project promises to assist the country in achieving both its environmental and economic objectives, even key promoters of the KGGI are suspicious of the president's motives. The testimonies of two interviewees are provided below.

I think that the environment was abused for economic growth because there was no balance between green and growth in the 4 Rivers Project. In the same context, some critics doubted whether the 4 Rivers Project could truly be really included in the realm of Green Growth. Especially, xxx, a key promoter of KGGI, often mentioned that the 4 Rivers Project harmed the image of Green Growth and wished to exclude this project from the category of Green Growth. Actually, it started with a clear limitation for pursuing the true green (putting the same emphasis on the environment as growth) because it was initiated as a core program of the Green New Deal (Interviewee 7).

The artificial touch on nature should be confined to a minimum because it is hard to fathom how nature reacts to it. It was a really dangerous idea to complete the remodeling of the main rivers within 3 years, which have formulated today's shape for 600 million years. The President might have confidence in it because he experienced a myriad of construction sites. He might think that the construction can do anything and the grand remodeling of river basins was not a big deal for the modern construction know-how and technology. Actually, it was the whole land-remodeling project. I have a strong question if it was really necessary to dig up all the rivers of the state under the name of the environmental protection. For this reason, it cannot help but being interpreted that the project does not have any meaning except as

an economic pumping policy to boom up the construction business (Interviewee 17).

9.3 Commodification of the Sky through the Carbon Trading Scheme: Who Wins and Who Loses?

The commodification of nature has also become another key feature characterizing the human-nature relationship along with the previously reviewed features of artificiality and governmentality. Humanity's material history can be described as the process of overcoming natural limits and transforming nature into human property. Since the Renaissance in Europe, humanity's emancipation from the shackles of religion and knowledge enabled the species to focus on conquering nature to achieve its own material progress. As a result, the destruction of the environment as illustrated by increasing air and water pollution, resource depletion, species extinction, etc. became widespread. Solving the environmental dilemma became one of the main concerns facing modern society. A plethora of solutions that promise to create a sound environment have flooded the policy space during the last several decades, but solutions utilizing the market system have obtained the dominant position in discourses and policies. Policies guided by market rationalism leave it to the market to resolve environmental disturbances through the principle of supply and demand. They begin by demarcating private-property rights for the parts of nature that still remain common property, such as oceans, rivers, air, and parkland, as common-property rights are thought to result in the over-exploitation and abuse of nature. The "tragedy of the commons" phenomenon proposed by Hardin (1968) undergirds this belief and provides a firm theoretical foundation for these market policies. Put simply, Hardin believed that the freedom of the commons results in environmental destruction. He

advocates creating private-property rights as a means of divvying up the commons could prevent humanity from exhausting its resources and polluting the environment.

Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all... The tragedy of commons as a food basket is averted by private property, or something formally like it (1968, p. 1243).

Hardin argues that private ownership of lands (including the state-owned type) would encourage individuals to use resources sustainably because this management system secures them the opportunity to pursue economic rent and transfer land. His argument also emphasizes the role of government in regulating the use of commons, as he believes the state must actively intervene through meticulous legal management guidance.

The owner of a factory on the bank of a stream... often has difficulty seeing why it is not his natural right to muddy the waters flowing past his door. The law, always behind the times, requires elaborate stitching and fitting to adapt it to this newly perceived aspect of the commons (p.1245).

Hardin's ideas for commons management became a sensation in many academic disciplines and were embraced by a wide of practitioners including economists, anthropologists, ecologists, environmentalists, geographers, political scientists, and development planners. During the last four decades, the tragedy of the commons has become the conventional wisdom in the field of property regime theory. Despite a plethora of cases²¹ refuting Hardin's arguments, the discourses and

²¹ According to Feeny et al., the tragedy occurs often as a consequence of the destruction of existing communal land and marine management regimes. However, many rebuttals to this argument have been observed across place and time. As a result of the Pennsylvanian Supreme Court decision in 1889, those who held surface land rights also acquired the rights to any underground oil, resulting in a doubling of

programs of international commons regime management continue to be based on this theory.

The Kyoto Protocol gave birth to the prevailing climate regime that legitimizes a system of private property rights for the sky. Under the Kyoto regime, the sky became commodified via the permit trading system and its flexibility mechanisms, such as Joint Implementation (JI) and the Clean Development Mechanism (CDM). One core program of the KGGI, the Korean permit trading system, mimics the mechanisms used in the Kyoto climate regime. This program commenced on January 1, 2015 in Korea in the face of strong resistance from corporations anticipating the damage it would cause by deviating from the conventional system, in which they have a vested interest. Because of the continued endeavors to defeat the regime, its future remains uncertain. Nevertheless, one can forecast the results of Korea's permit trading system by studying similar regimes that have already been implemented in other parts of the world. The stories and lessons from other permit trading systems can be used to

drilling and other capital costs, substantial reductions in the overall rate of recovery, and the disappearance of economic rents (6). Examples of successful communal property regimes are easily found in traditional and modern societies, remote and sparsely populated regions, and undeveloped and well-developed areas. The cooperative-based coastal fisheries in Japan and many island nation states in the Pacific, as well as the community-based lobster fishing territories in Maine represent some of the many successful examples of communal property regimes (7). In many cases, state property regimes fail and result in the overexploitation of the commons. The Nepal case provides a vivid example. The Nepalese government nationalized the communal forests in 1957, which opened access to forests and accelerated deforestation. In 1976, the government began to explore re-establishing communal property rights. Similar cases can also be found in Niger and Thailand (Feeny, Berkes, McCay, & Acheson, 1990).

extrapolate whether the Korean permit trading system will lead the KGGI down the path of a paradigm shift.

9.3.1 Commodified Sky: A Means of Reproducing the Winners of the Conventional Paradigm

This analysis of the commodification of the sky starts with a simple functional equation:

$$F(CT) = \alpha R(CT) + \beta C(CT) + \chi E(CT) + \delta B(CT)$$

In this functional equation, $F(CT)$ indicates the social welfare that the Carbon Trading (CT) system is expected to generate. R is the expected total revenue from the carbon trading system drawn from rents from derivative products and permits transactions, government revenues, and so on. C indicates the cost corporations bear for pollution by complying with the carbon trading scheme and encompasses the cost of purchasing permits, introducing new facilities and equipment, investing in clean technology R&D, etc. These two variables, R and C , are monetarily calculable and directly borne by the participants in the carbon market. Unlike R and C , E and B represent effects that are universally applicable to the whole community. E is the greenhouse gas reduction effect. B constitutes the burden that general people outside the carbon market must bear for the system, such as increases in utility costs, decreases in the livelihood-generating base of indigenous communities as brought about by the Clean Development Mechanism (CDM), etc. The parameters α , β , χ , and δ are dependent on various factors including the financial market situation, level of clean technology, number of total permits, type of flexibility mechanism, penalty scheme, bargaining power of polluting businesses over government, etc. Generally, it

is expected that the parameters α and γ will show positive effects, while β and δ will show negative effects.

Put simply, the virtue of this program is that it enables market participants to seek economic rents while tackling apocalyptic climate change at the same time. However, the question remains as to whether this can be attained through this scheme. According to the functional equation described above, the variables that make this scheme work in the market are R (revenues) and C (costs) because rent seeking is the core purpose of the market system. In this context, the government cannot help but persuading prospective market participants, mainly corporations and financial agencies, to enter the scheme by maximizing the sum of R and C. Persuading prospective market participants to join is key because the commodities being traded (emissions quotas) are fictitious entities with no tangible utility value, and the use of the sky is difficult to exclude compared to other commons such as land, forests, etc. In light of this, the only way to gather sufficient support for the trading scheme is to give the prospective market participants confidence in the rent seeking aspect that maximizes the sum of R and C. From the beginning, the game is characterized by the overwhelming bargaining power businesses have over the authority. As Lohmann points out:

The state-corporate nexus necessary for the formation of the climate commodity is read as a ‘potential’ conflict of interest... The carbon market’s decade-long failure to achieve climate results is attributed to ‘insufficiently tight emissions caps’, and thus failed ‘governance’, rather than as flowing from a structure in which the caps’ function is to create a new commodity without affecting general price stability or fossil fuel dependency, as well as to keep other climate initiatives at bay (2012, p. 101).

It is inevitable that E and B scarcely received attention in the design of the scheme. In reality, E, i.e., CO₂ emissions reduction, is treated as a natural conclusion despite the myriad of concerns surrounding the institutional conditions that led to real emissions reductions. The EU-ETS example provides strong evidence to suggest that an over-allotment of permits (used as a means of persuading participants to enter the market) can hinder the emergence of as strong and as efficient a market as expected. Bond elaborates on the predestined failure of this scheme by citing diverse investigations and statements of specialist groups:

As Peter Atherton (2007) of Citigroup conceded, “ETS has done nothing to curb emissions...[and] is a highly regressive tax falling mostly on poor people. Asking whether policy goals were achieved, he answered: “Prices up, emissions up, profits up... so, not really. Who wins and loses? All generation-based utilities-winners. Coal and nuclear-based generators-biggest winners. Hedge funds and energy traders-even bigger winners. Losers...ahem...Consumers.” A Wall Street Journal (2007) investigation in March 2007 confirmed that emission trading “would make money for some very large corporations, but don’t believe for a minute that this charade would do much about global warming.” The paper termed the carbon trade “old-fashioned rent-seeking...making money by gaming the regulatory process...As Guardian revealed, the ETS provided “hundreds of millions of pounds to some of Britain’s most polluting companies, with little or no benefit to the environment (2012, p. 691).”

Accordingly, the winners and losers of the carbon trading scheme are clearly apparent. The winning side compromises those who possess privileged positions within the conventional capitalist market economy that ironically generated the modern negative externalities of air pollution and carbon emissions the scheme seeks to correct. On the contrary, the losers who bear the greatest environmental burden of the scheme are the environment and general population, particularly the poor and minorities, due to their low position in the PP.

Another concern over this market solution, which relies on the commodification of the sky to achieve its environmental objectives, is that it can accelerate ecological destruction and exacerbate the disparity between the haves and the have-nots. Moreover, the negative consequences associated with commodifying the air through this scheme are not confined to the territory of the country that initiated the policy. Emissions trading schemes and related practices can even impact the commons held by indigenous tribes in the underdeveloped world. For example, the Clean Development Mechanism²² (CDM) of the Kyoto ETS has caused disturbances beyond the spatial boundaries of participating states. The CDM, which is based on the idea that greenhouse gas emissions can be offset or reduced by expanding renewable energy resources or investing in carbon sinks that utilize the Earth's carbon pool including forests, vegetation, soil, and the atmosphere, becomes a venue through which policy actions of the Global North deteriorate the ecosystem and economic structure of the Global South in many cases. In other words, the biosphere utilized by the CDM to store carbon becomes subject to artificial manipulation and enclosure for the convenience of project implementers. These actors neglect the local context by following the rule of monetary efficiency rather than the rule of nature. Many carbon

²² According to Article 12 of the Kyoto Protocol, the CDM allows an ANNEX I party with an emission reduction commitment and an ANNEX II party with an emission-limitation obligation to implement emission-reduction projects in developing countries. Through CDM projects, implementers earn certified emission reductions (CERs) that are equivalent to one tonne of CO₂ each. The CERs are traded and used to meet a part of their emission reduction targets under the Kyoto Protocol. Article 12 states that the CDM has a win-win structure in that it stimulates sustainable development of developing countries and provides developed countries opportunities to achieve a part of their reduction targets in the most cost-efficient manner.

sink projects are associated with the destruction of local ecosystems and displacement of local indigenous populations. According to Thibodeau:

In some cases local people have been forcibly removed-as was the case in Uganda where 13 villages were evicted for a Norwegian-sponsored carbon sinks project. Further, the Kyoto Protocol permits access to land in upwards of 10 million hectares for re-forestation CDM project to generate credits for wealthier countries, leading to destruction of the environment through the use of herbicides and pesticides, loss of biodiversity, and water use disruption due to the planting of non-indigenous species (2010, p.29).

Environmental injustice is not an unprecedented phenomenon, nor is it limited to carbon trading schemes. But extending the application of the private property rights to other commons and integrating regions into the global capitalist economy has nonetheless increased the severity of environmental degradation and poverty in communities that are highly dependent on nature for subsistence. This propensity of emissions trading schemes to exacerbate environmental and social problems is vividly demonstrated by a myriad of cases occurring all over the developing world. In recent times, commons that used to be shared by all of Earth's species, such as the sky, water, biodiversity, and forests, have become turned into monetized, transferable commodities under the auspices of the market.

Paradoxically, the international environmental governance founded on the commodification of nature accelerates environmental degradation and causes ever-growing poverty of innocent people who are rarely responsible for global warming. The fate of the biosphere is in grave peril when the logic of economic efficiency informs international environmental governance. Byrne and Glover note:

Global-scale replacement of commons values by free or regulated trade regimes with those of commodity is seen as leading to a pervasive "environmental colonialism"(Agarwal and Narain 1993) and "biopiracy" (Shiva 1997, 2000) (Byrne & Glover, 2002, p.19).

In conclusion, the rapidly intensifying commodification of nature—which has taken place even during the proposed paradigm shift—reflects the contemporary pursuit of unbalanced economic development and progress, a key factor contributing to the perception that humans should play a superior role as the dominator of the ecosystem. It is a curious feature of this age, when the spirit of mastery over nature dominates, that diverse means of addressing modern anomalies become avenues of reproducing and reinforcing the power structure of the conventional paradigm.

9.3.2 The Korean Permit-Trading System: A Compromise with Business

Doubtless there will be no difference in the consequences that the Korean permit-trading scheme will cause as the same outcomes generated by the early adopters of the permit trading system are being reproduced in Korea. The testimony of Interviewee 5, who was deeply involved in the creation of the Korean permit trading system, demonstrates how the imbalance of power impacted decision-making in the real policy arena. This interviewee remarked, “Our aim was, most of all, to open the emission trading market... We could not help but largely embracing the claims of business in the design of the system”.

The government made one more big retreat during the permit allocation stage. In September 2014, four months prior to enforcement, the government decided to cut the emissions reduction target by 10%. This action resulted in industry being allocated a significantly higher number of permits than originally planned, which, according to a government source, represented a 40% decrease in the initial reductions target.

Interviewee 8 who was responsible for the implementation of the scheme remarked:

The situation changed. The national economy was bad. The New economic team stressed the recovery of economy. The team accepted the business’ argument that the competing countries did not introduce

the permit-trading scheme and why Korea had to adhere to this policy. The final decision was that it would be implemented as scheduled but the burden on related industries would be considerably relived for a soft landing [in the shoes of business] at the first phase [2015 through 2020].

Despite the considerable retreat from the initial permit allocation plan, this officer was not opposed to the general concept of the Korean permit-trading scheme. Rather, this person argued that the future of the Korean scheme would be different from the EU-ETS because the flaws that have hampered the efficacy of the European scheme were mostly removed from the Korean policy. The difference between the EU-ETS and the Korean scheme is threefold. First, unlike the EU-ETS, Korea holds relatively exact emissions inventory information for companies prior to enforcing the permit trading scheme, and despite allocating more permits than the initial plan, the amount of permits still might not be excessive enough to invalidate the market function. Second, in order to prevent potential disruption in the market through speculative rent seeking, the Korean scheme forbids derivatives trading. Finally, the international linkage of the trading system has been postponed until the second phase of the Korean scheme beginning in 2021. As a result, permits from CDM projects in other countries cannot be traded in the Korean market. Related to this decision, this authority explained that the purpose was to protect the incentive of domestic permit sellers by blocking the influx of cheap permits from outside Korea.

From this explanation, it is apparent that a Korean CDM market structure might be sounder than the previously attempted EU-ETS. However, the social implications and ironies embedded in carbon trading, and carbon markets in general, remain the same. The basic idea of the permit-trading scheme, that is, to allow for rent seeking and increase emissions reduction at the same time, still provides a large advantage to businesses by increasing the quantity and volume of carbon traded, even

in the Korean system. The substantial increase of permits as the result of the compromise with business clearly illustrates the contradiction of carbon governmentality. Hitherto, the creation of carbon markets involves a governmentality of carbon that defines the objects of government through certain techniques and devices. As a result, governing carbon markets reflects features of ‘advanced liberal government’ or self-regulation as opposed to governing in a totalizing manner. Furthermore, even though government officials mentioned that the resistance of business alone stood out because beneficiaries did not engage in collective action, the government’s focus on creating economic rent by incorporating preemptive techniques and devices for domestic permit seller industries was paramount. Therefore, the decision could not have been made through an ethical consideration of the results that the trading system would provide. For instance, although a few factors that could cause adverse sociological consequences in the Korean scheme were pushed back until its later phases, this is only delaying the inevitable effects that come with commodifying the sky.

9.4 Unchanged Society-Environment Relations: Dominance and Subordinance

Modern progress was deeply indebted to the transition of environment-society relations. The change in how humans viewed nature contributed to the reduction in the physical limits and spiritual taboos against exploiting nature for the sake of enhancing physical comfort. In this maelstrom of change, nature became subordinated to human utility. Heavy use of fossil fuels and raw materials, substantial discharges of waste, vast deforestation, and dramatic changes in land use led to the planet experiencing an alteration within the past 200 years like nothing else that had occurred in humanity’s

existence. Industrial development transformed the planet in terms of both the configuration and quality of the environment.

The mega-transformation of the planet that occurred during this time was predicated on a specific way of managing nature. Moreover, three key factors that characterize the modern environment-society relationship, i.e., governmentality, artificiality, and the commodification of nature, also served to accelerate the process of modernity and became intensified by interacting with each other in the modern world. Governmentality and artificiality were employed by modern societies to help humans dominate nature in the most efficient way. These two factors are inseparable as they relate to humans exercising control over nature. Governmentality is used to transform nature into more manageable substances through societal knowledge and techniques (thus, the progress of knowledge has been accompanied by intensified governmentality), and the increasing artificiality of nature is both a consequence as well as a motive of this process. The commodification of nature further provides a means for humanity to gain economically by governing and artificializing nature.

Controlling nature in this way provided humanity with economic prosperity and comfort, but society would also have to pay the price in the form of environmental degradation and climate change. Such catastrophes may be the natural consequence of finite human knowledge. The fact that today's discourse is inundated with proposed alternative paths for halting further ecological calamity is perhaps a sign that the environmental transformations promoted by modernization already exceeded the limits of what nature could handle.

In this sense, a paradigm shift has to begin by questioning humanity's mastery over nature, and then seek to pursue change in a way that will reset the society-nature

relationship created by modern methods such as governmentality, artificiality, and the commodification of the environment. Unfortunately, projects that claim to be part of a paradigm shift can just as easily further intensify the problematic factors of modernity.

Indeed, the number one project of the KGGI, the 4 Rivers Restoration Project, is emblematic of this phenomenon. The ambitious project was promoted in a way to reinforce the artificiality of the main Korean rivers and maximize governmentality for their more efficient management. Riverbanks were beautified by artificial landscaping and the river ecosystems were rearranged according to the plans of technicians. The project also was initiated for the purpose of obtaining economic benefits. It was thought that beautifying the waterfront to humanity's taste would attract more travelers and that the construction work would increase the country's GDP. Additionally it was thought that the Korean river and waterfront development model would be a promising commodity to export to other countries.

Another core project of the KGGI, the Korean permit-trading system, followed the same path of previous carbon trading schemes that pioneered the commodification of the sky. The precursors of the Korean permit-trading system already demonstrated that they reflected the same winners and losers of traditional capitalist economy even in the context of the alleged new paradigm. Specifically, huge emitters (e.g., utilities), hedge fund owners, and energy traders became the winners once again by benefiting the most from the scheme, while consumers and the environment remained the losers. In other words, the Korean scheme did not significantly differ from the precursors it copied.

It is obvious that the world the KGGI seeks to build will not deviate from the path the current paradigm has followed. Intensified governmentality and artificiality

will only engender more complicated technics and concentrate greater power in the hands of a few elite professionals who alone can understand the logic of technics. Opening up the commons to trade will only produce the same political economic relations as the current market-driven paradigm. Therefore, for these reasons and others, the KGGI that is founded on a dominance-subordination relationship between society and nature cannot be considered a paradigm shift.

Three years after the 4 Rivers Restoration project was completed, multiple criticisms of the project have been articulated. Several of these critiques have centered on the ecological damage that occurred to the river ecosystems. The backlash to this project has caused many in Korean society to question whether pursuing policies that intensify the artificiality and governmentality of nature is the correct approach for improving ecosystem quality. For this reason, policies in line with the 4 Rivers Restoration project are not likely to be sustainable in the Korean policy setting. This leads to the conclusion that GG will have difficulties in fostering a policy shift.

Chapter 10

WHO GOVERNS AND WHO EARNS?

Section 4.5 explored provided a portrait of the dominant modern governance system. Beneath the institutional democratic system, the true shape of governance in the PP was shown to consist of experts and bureaucrats monopolizing decision-making on the basis of their sectional expertise. The dominant expert system was excluding the general citizenry who had to endure the effects of the experts' decisions, and its operating principle depended on objective and general knowledge while values and contexts were considered taboo. In this milieu, the people lose their rights and have little choice but to consume what the expert system has decided to supply to society in abundance. However, what the expert system has really begotten is a modern society full of anomalies including environmental degradation and social disparity. Reflecting on the reality that the contemporary generation is facing has brought forth mounting demand for a paradigm shift or change in the social operating system.

GG claims to be an effort to overcome the limitations of the prevailing system. Achieving GG requires comprehensive changes, not only in institutions and modes of production, but also in every corner of people's lives. In other words, every citizen has to understand the urgency of the crisis and join the revolution; the hierarchical administration of current times alone cannot lead to meaningful changes. In this chapter, the location of ordinary people in the policy initiative is explored in order to examine if the governing system of GG continues to be monopolized by experts and bureaucrats.

10.1 Unchanged Superiority of Bureaucrats

South Korea is a typical developmental state in which a powerful bureaucratic system has led the nation's development. Passing through the period of colonization by Japan and following the civil war at the beginning of modernization, hegemony lay in the hands of the public sector, namely, the government and army. In some ways, this power structuring was a natural conclusion considering that civil society was not in the position to acquire the ability to lead the country's social and economic development by itself. Also, the civil sector's inadequate capacity for accommodating the social elite accelerated the concentration of human resources in the public sector and resulted in bloated government power (Jung et. al., 1999).

10.1.1 Democratic Board System Utilized for Legitimizing Bureaucratic Power

The birth of civilian government²³ became a starting point for changing the unilateral leadership of government. After the nation's democratization, civilian regimes have attempted to check the state's bureaucratic power and increase the transparency of governmental decision-making. As one critical tool for accomplishing these goals, the government board system was incorporated into the government's organizational structure. The purpose of this system is mainly to alleviate the undemocratic tendencies of bureaucracy by incorporating a diversity of interest and civic groups in the decision-making process. Another one of the board system's merits concerns its ability to address the lack of technocratic knowledge in bureaucratic

²³ The first civilian government was created at the presidential election of 1992. In this election, Kim Young-Sam, who had struggled for the democratization of the nation, was elected as the fourteenth President of South Korea. By his election, South Korea ended control of military junta that continued since the Park Jung-Hee Administration came to occupy power in the May 16th coup of 1961.

organizations by bringing in outside experts to participate in governmental decision-making (Kim & Kim, 2002). Despite its virtuous purpose, however, this system often has been abused to justify the bureaucracy's decisions; in other words, to pretend as though decisions are reached through democratic means. As Kim and Kim note, "It becomes even worse if it is used in a way that boards are only instruments to approve policies that government officials already made for them free from the responsibility of decisions" (2002, p. 3).

While the South Korean civilian administration introduced this system to restrain the unchecked power of bureaucrats, it has since degenerated into a means of legitimizing the decisions of bureaucrats or warding off civil resistance toward controversial public projects. During the Kim Dae-Jung (1998-2002) and Roh Moo-Hyun (2003-2007) administrations, the use of government boards rapidly increased accompanied by greater criticism. An analysis of press reports conducted by Kim and Kim shows that, "the press points out that the proliferation of boards overshadows the government's will of small government. Even worse, most boards are merely rubber stamps because they remain token advisory" (2002, p. 7).

Most boards revealed serious flaws in the representative capacity of members. Government departments tended to commission members from their policy clientele pools or expert groups, which resulted in most boards reinforcing the dominant power of bureaucracy rather than securing the participation of citizens in the policy process. Kim and Kim also point out this problem, "ministries have requested civil organizations in the relationship of partnership to recommend members of boards. Also, they have preferred notables who can be symbolic persons to raise the acceptance of boards' decisions" (2002, p. 14).

10.1.2 Concentration of Power in a Small Bureaucratic Elite Group

The Lee Myung-Bak Administration utilized the board system for creating the governance structure of GG. As the decision-making body for GG, the Presidential Committee on Green Growth (hereinafter referred to as the Committee) was created under the control of President (Article 14, Framework Act on Low Carbon Green Growth hereinafter referred to the Framework Act). The Committee is comprised of 50 people, including the Minister of Finance and Strategy, the Minister of Knowledge Economy, the Minister of Environment, and the Minister of Land, Transportation and Maritime Affairs, in addition to experts in related fields commissioned by President. The Prime Minister and a civilian appointed by the President co-chair the Committee. The Committee has subcommittees to assist in keeping the discussion and working process efficient, and the Green Growth Task Force was set up to support the Committee and generally carry out its activities. The Secretary to the President for National Future and Vision and a high-ranking government official were chosen to co-head the Task Force, an appointment that has had significant impacts on the Task Force's decision-making. Although the Task Force is only a supporting body for the Committee, the choice of leadership ensures that its policies reflect the will of the President. In other words, the Task Force's ambiguous status within the Committee reveals a discrepancy between official and real power. The Task Force is composed mostly of government officials dispatched from ministries, local government officials, and the staff of national research centers. Local committees on GG were also created under the control of metropolitan mayors and provincial governors. The Lee Myung-Bak Administration executed the KGGI through a system in which the central and local governments cooperate, in addition to diverse interest groups, civil groups, and

experts having a voice in the policy process. (The KGGI governance system is illustrated in Figure 1.1.)

The question remains as to whether this system differs from that of the PP, which was characterized as bureaucrat-dominated and included token civil participation only to justify bureaucratic control. It also must be asked if this system overcame the undemocratic feature of the current governing system in which experts and bureaucrats hold the majority of power as examined in Section 4.5.

To scrutinize this, the true contour of the Green Growth Committee must first be unveiled. Although the formal structure of the governance system incorporates democratic elements, government boards have often reproduced the typical bureaucratic system in practice. Thus, a key task of this examination is to determine whether the Committee had actual power beyond merely providing procedural justification to what bureaucrat organizations had already decided. The examination begins by disclosing the function of the Task Force and its relationship to the board as revealed by the working process of the Presidential Committee on Green Growth. According to the explanation provided by Interviewee 5, the main responsibility of the Committee was to examine the diverse policy choices associated with GG and to decide which policies to incorporate into the KGGI agenda. The pace and content of their work depended heavily on the schedule of the Committee meetings, usually held every two to three months, that were presided over by the President. In these meetings, Committee-dictated agendas were reviewed and shaped into detailed policy programs that were presented to the President and confirmed as the government's official policies. The activities of the Committee converged in preparation of this meeting. Every morning, the head of the Task Force and the directors of each division had a

meeting to review diverse agendas and share progress. The civilian chairperson of the Committee joined this meeting once or twice a week. During this process, the Task Force worked closely with the Secretary to the President for National Future and Vision who also served as its co-head. Through this Secretary's leadership, the will of the Presidential Office was reflected in each policy from the initial stage onward. As a matter of fact, one could say that the Task Force was a bureaucratic organization constructed outside the Presidential Office for the purpose of actualizing the Presidential agenda. Decisions made at these meetings were sent to subcommittees for processing and afterwards became the agendas guiding the plenary session of the board. Committee members presented their opinions at board meetings, but the decisions of the Task Force scarcely ever changed. Actually, since diverse discussions, interdepartmental coordination, consultations with the Presidential Office, and major decision-making had already been completed at the Task Force stage, there was rarely any room left for the board to modify key parts of the submitted agendas, as demonstrated by a statement made by Interviewee 5:

The locus of the Committee was the Task Force that was comprised of about sixty elite bureaucrats dispatched from multi government departments. More than 90% of Committee's work was executed by the Task Force".

It seems that the Green Growth Task Force had great power within the Committee. This power stemmed mostly from the authority of the President, as GG overwhelmed other policy agendas and significant national resources were shifted to it. The Task Force was strongly backed by the Presidential Office and was able to control related ministries as its agent. Moreover, the Task Force persuaded and sometimes forced ministries and interest groups who were resistant to the new agenda to follow the guidelines of the Committee. This body also acted as an implementer of

its own policies in cases when ministries opposed against the Committee's decisions. Needless to say, it was uncommon for a supporting body of a government board to have such strong power. Interviewee 3 illustrates this situation as follows:

The main responsibility of the Committee, I think, had to be limited to set the direction of Green Growth, clarify the role of each government department, coordinate conflicting interests among ministries, and evaluate the performance of each body and feedback the evaluation result in the policy formation. However, when I began my work at the Task Force, I found that it was even implementing several programs by itself and had a large organization reaching to sixty personnel.

The powerful Task Force of bureaucrats was very effective in driving GG policies and institutionalizing them in a very short period of time. In this aspect, the group's activities faithfully matched the intention of the architects of KGGI. As Interviewee 1 states:

The KGGI was presented as a development paradigm... We wanted to build a long-term national vision for country's future in the office of President [Lee Myung-Bak]... We focused on establishing the institutional framework for Green Growth i.e. the enactment of four major acts and international regime building. The Task Force played a key role in doing that... We have been often criticized due to the 'top-down' practice. That is true. However, it was an only option we could choose for the Task Force under the control of the Presidential Office to lead Green Growth, because of time constraint stemming from five-year single term presidency. Thus, much work was done in the very short period time.

Ironically, the governance system that was designed for building a long lasting, sound structure prevented the spirit of the GG initiative from being internalized by all government officials as a whole. This failure arose from the difficulties associated with motivating all members of governmental organizations to push GG forward due to the monopoly the Presidential Office and the Task Force held over decision-

making. Interviewee 9, a middle level government officer working for the Committee, pointed out this problem as follows:

For me, it left much to be desired that the strategy and planning of the Committee was not democratic... Due to the lack of the role division between the Committee and ministries, common sense for Green Growth at the level of the whole government was not formed. Most ministries merely made a pretense of working when decisions were conveyed from the Task Force.

Each ministry pumped out a number of GG-related programs, however, the significant share were pre-existing programs that had been green-washed. Interviewee 18 testifies as to what was happening at the level of each ministry as follows:

I acted as an advisor to deliberate national budget bill at that time. From the second year of the KGGI, programs with 'green' in their names began to proliferate. One reason of that, if a program was classified into the category of Green Growth, it became easier to obtain budget... Anyway, when their real contents were unveiled, many cases exposed their true shapes of existing programs.

The dominance of top-down decision-making caused problems in the real policy field. Officers of local governments, in charge of producing and implementing detailed programs affecting real industrial sites and the living environment of citizens, neither understood the exact details of GG nor made action plans appropriate to the context of each locality. Doubts as to the sustainability of GG programs also served as a crucial barrier that discouraged local officers from internalizing the agenda, which was unilaterally conveyed to them. Interviewee 17, a board member of the Committee, points out:

The Meeting of the local committee of a special metropolitan city was held one or two times a year. The allocated budget to the committee was only about USD 500 per year... Provincial and metropolitan governments didn't move and local governments raised a questions what Green Growth is and what they have to. They just followed as the

central government guided but they didn't know where they had to move forward.

10.1.3 Public Excluded from Decision-Making

The circumstance of civil society was much worse. Civil society, which had to be the main agent of change if the GG revolution were to succeed, was treated merely as the group expected to comply with the policies that the government arranged. When it appeared that citizens could not understand the concept of GG—a phenomenon that abruptly emerged during the Lee Myung-Bak Administration—the Framework Act was created to define the responsibilities of citizens. Article 17 of the Act lists the three duties of citizens. First, every citizen is obliged to actively practice a green lifestyle. Second, green consumption is framed as a public obligation. Third, the article dictates that people have the duty to be the last troubleshooters and campaigners for a better environment. The problem with the Framework Act, however, is that unilateral policy decisions and governmental PR rarely obtain the desired results. Interviewee 18 attributed civil society's failure to embrace GG to a lack of understanding about the unilaterally-given governmental agenda.

Medium and small scale businesses wanted to know what Green Growth meant to them but there was no clue about that. It was same to venture business and the public. Every agent didn't know what he or she has to do (Interviewee 18).

As examined above, decision-making power was still concentrated in the hands of a small bureaucratic elite group within the KGGI. Most members of the government, as well as the public, were excluded from decisions that they were tasked to implement, which would affect the very environment around them. It became clear that the efficiency rule was overwhelming other values and that a minor elite was governing the KGGI.

10.2 Reproduction of Vested Rights

10.2.1 Cooperation of Expertocracy and Bureaucracy

The discussion moves to unveiling who finally become the beneficiaries of the KGGI governance system controlled by a minority of elite bureaucrats. Considering the decision-making structure of the KGGI, the answer is easy to spot. As uncovered in the previous section, despite the appearance of democratic practices, the governing body did not fundamentally change from the existing system. The board of the Committee, which proposed to incorporate the diverse voices of society into the policy process, merely served as the rubber stamp approving what the bureaucratic organization had already decided. This passivity partly stemmed from the limitation provided by the non-standing membership of the board. The members convened for a meeting every other or every three weeks. Because of this, most of the work process was occupied by the standing organization: the Task Force. In theory, the Committee could reject any of the Task Force's decisions during the post-deliberation process, but nothing suggests this ever happened. The reason for this can be traced to the constitution of board members. Table 10.1 shows the background of the civilian members of the board. During 2009 to 2012, the board was configured three times by the term rule of the Framework Act. In each term, experts filled more than 60% of board positions, with 80% in the first term, 74% in the second, and 65% in the third. According to their detailed biographies, most experts were professors at major South Korean universities, and a significant portion were on other government boards or were public officials prior to joining the Committee. Some members served as presidents of academic societies or were public figures. In contrast, civil groups expected to provide a voice for the public were notably underrepresented. In the first

term, only 3% of members were from civil society. This ratio rose up to 12% in the second term but fell to 6% again by the third term. By comparison, industry was represented much more securely than civil groups. Its ratio of member began as 13% in the first term, dropped to 6% in the second, and recovered to 21% in the third. The backgrounds of the remaining board members suggest they represented other white-collar professionals, as the board included a politician, journalist, lawyer, and educator (high school principal).

Table 10.1: Background of Civilian Members of Committee on Green Growth

	Experts	Civil Groups	Industry	Others	Total
First Term	22	1	4	3 (Politician 1, Journalist 1, Lawyer 1)	30
Second Term	25	4	2	3 (Politician 1, Journalist 1, Lawyer 1)	34
Third Term	22	2	7	3 (Journalist 2, Education 1)	34

Source: Committee on Green Growth. (2013).

The career composition/ratio of the board can be interpreted various ways. First of all, the career composition of board members mirrors the expertocracy of the PP. Even though the expert group did not lead the Committee, their expertise contributed to legitimizing the decisions made by bureaucrats, who needed the authority of experts to enhance the validity of their views. In this sense, it can be said that expertocracy and bureaucracy operate in a cooperative, interdependent relationship in the KGGI. In addition, the fact that a considerable number of members

in the expert group have served on other government boards reinforces doubts that these experts might be government allies in disguise. This suspicion is reinforced when considering who exactly represents civil society on the Committee. Civil society representatives do not appear to truly represent the interests of the public because their activities have been too marginal to engrave their presence in people's minds. Rather, it gives a strong impression that the government selected them for their pro-government inclinations. This problem happened in the local committees in a more explicit way. Kim (2009) worried about the possibility of perfunctory governance in the local committees as follows:

[According to interviews with local public offices] most board members of the local committees overlap with those of 'Local Agenda 21' of the previous administration ... it is obvious that the local committees are improvised. Civilian members look scarcely representing citizens. Many members don't have any background related to Green Growth or environmental issues (2009, p. 288-298).

10.2.2 Governing Body Represents the Haves of Society

Member composition bias can work in such a way that the board helps existing viewpoints and values prevail even in the midst of a progressive new paradigm. That is to say, new policies may be introduced in the name of the paradigm shift by reflecting its embedded principles, but political pursuits remain in the same realm as the existing policies. A board composed of renowned people—mostly representing 'the haves' of society—will be limited in providing a balanced representation of the citizenry's many conflicting interests (Yoon, 2009). Even worse, not one of the board member groups can be said to stand for the interest of the general people. The expert group is comprised mainly of professors who have a high social status in South

Korean society. The industry group, who makes up the second largest portion of the board, logically has the duty of safeguarding vested interests.

The strong incentive many in this governing body have for preserving the prevalent paradigm, and with it their own vested rights, is likely to produce policy outcomes in which the winners of the existing paradigm once again become the champions of the prospective paradigm. In practice, this phenomenon came to be witnessed across a diverse range of new policies. Interviewee 18 brings forth a strong point that the clients of the FIT (Feed-in Tariff) or RPS (Renewable Portfolio Standards) are not citizens, but rather businesses.

The biggest problem of FIT or RPS is that both of them are not for citizens. They are for business. The reason why the penetration grows at a faster rate under FIT or RPS is that business can make money through those schemes. I have a strong question about securing profits for business with people's tax money. In the case of Europe, citizens become the direct beneficiaries of renewable energy programs. Business indirectly benefit by the increasing business opportunities as the penetration of renewable energy grows. The benefit system for the renewable energy penetration has to be changed into a structure giving favors to citizens... I have raised a question why people cannot earn gains with the installation of solar panels on their rooftop, by contrary, businesses make profits from the solar projects (Interviewee 18).

The KGGI also repeats the prevalent structure that guides the allocation of government resources. Article 17 of the Framework Act officially demands that citizens become faithful consumers of green products and mandates that they stimulate green business by changing their consumption patterns. The role of citizens in the KGGI recreates the traditional market relationship in which businesses lead the economy by creating wealth, and general people share some of the created wealth through the 'trickle-down' effect. This is supported by the fact that most interviewees answer 'businesses' when asked who mainly benefits from the KGGI. The supposed

new paradigm results in the beneficiaries of government policy changing merely from some industries to others rather than from existing haves to have-nots.

10.3 Reinforcing the Existing Have and Have-not Structure

The contour of the governing system reflects the attributes of its power structure. A minority of elites who make up the expertocracy and bureaucracy of the country have also been the governors of the modern paradigm. These two elite groups retain their qualifications for rule by reflecting in their work the efficiency that has been the engine of modern affluent industrial society. The existing have and have-not structure responsible for so much social inequality has been formed by the governance system controlled by the elite expertocracy and bureaucracy. Thus, a paradigm shift requires a shift in power from the minority of elites to the people who have been excluded from decision-making. However, a transformational change rarely occurs when the existing elites who are prone to stay rigid in their bureaucratic straightjackets still occupy the decision-making processes of society.

The governance constructed to promote the KGGI appears to be democratic on the surface. Decision-making power is concentrated in the hands of the board of the Committee on Green Growth, which is comprised of civil groups, industry, journalists, politicians, lawyers, educators, experts of related fields, etc. But this was only superficial. Decisions that were supposedly made by the Committee were actually made by a supporting body composed of elite bureaucrats. Even at the broader government level, KGGI projects were implemented in a strong top-down manner. This prevented the KGGI objective from being internalized among government members.

Furthermore, representation in the KGGI's decision-making body was considerably skewed toward the haves side of the current power structure. Two-thirds of the board members were experts who were well-known in their fields, and some were even appointed as members for other government boards. Civil groups who are supposed to provide a voice for citizens were also fairly underrepresented. In this situation, it was an inevitable conclusion that a minority of bureaucrats would occupy a position of power once again and that expertocracy contributes to play a large role in the Korean governing system.

The inquiry conducted in this chapter verifies that bureaucracy and expertocracy, the two dominant trends in the governing system of modern society, remain undiminished even in a prospective paradigm shift like the KGGI. The KGGI demonstrates that leaving the governance system unchanged—i.e., allowing power to be concentrated in the same body—will not generate any change in how power is structured in society. Even the introduction of new institutions and policies can serve to reinforce the existing unequal relationship between haves and have-nots.

Chapter 11

ENERGY INTENTIONS OF THE KGGI

Chapter 5 described the energy system of the PP. This energy system is vital to the paradigm's pursuit of progress, as the development of cheap and abundant energy sources made it possible for humanity to achieve a society based on mass production and consumption. The analysis in chapter 5 showed that the energy system of the PP showcases its core characteristics. The abundant and cheap energy system is both an outcome of the PP and the engine that enables its continuation. In this sense, the PP's energy system is a major cause of modern crises. In an effort to address some of these crises, the KGGI put an emphasis on shifting Korea's major energy sources from fossil fuels to low-carbon energy sources. However, this small change in the country's energy focus is not sufficient proof of a paradigm change. A good grasp of the energy intentions of the KGGI is needed to reveal whether Green Growth represents a genuine shift from the cheap and abundant energy system of the PP.

11.1 Energy Development of Korea²⁴

11.1.1 Establishment of an Abundant and Cheap Energy System to Support National Economic Development

In many ways, South Korea's path to its modern energy regime is globally recognized as extremely innovative compared to other countries. At the beginning of the country's initial modernization stage, South Korea experienced severe energy poverty like most developing countries in recent times. Upon implementing a number of new policies and laws, however, the country established a vibrant, well-functioning, centralized large-scale energy system in a very short period of time. The modern energy sector development is closely linked with the country's aggressive economic development path. In the 1960s when South Korea embarked on a path of aggressive economic development, the energy sector too began to show signs of rapid expansion leading to the development of the current energy-abundant, industrialized country. As a resource-poor country, securing a reliable supply of energy capable of supporting the industrialization process, which was primarily dependent on energy-intensive heavy industry, was a key responsibility of the Korean government. Also, as an aggressive catch-up country, cheap energy was a vital requirement to guarantee national security and the competitiveness of Korean products on the international market. This fact was highlighted in the second national energy master Plan:

The government has put the first priority of energy policy on ensuring the stable energy supply in cheap required for economic growth, citizens' life, and industrial production.

²⁴ This section heavily depends on Energy Policies (2013), which is one of the Korean government's knowledge sharing program series.

11.1.2 Initiation of Energy Development

In the 1950s, Korea suffered severely from a lack of abundant energy resources. More than half of its existing energy facilities were destroyed in the Korean War between 1950 and 1953. In addition, economically-accessible domestic energy resources were limited to anthracite coal and renewables. The national energy policy in the 1950s concentrated on developing coal deposits and expanding the capacity of coal-fired generation utilizing domestic coal. As a result, the share of coal in total energy production soared from 19.2% to 43.6% within a decade (1955 to 1965).

In the 1960s, the domestic coal dependent-system could not meet the growing energy demand generated by full-scale economic development. Between 1962 and 1971, when the first and second 5-Year Economic Development Plans were introduced by the Park Jung-Hee Administration, the plan to establish a secure and reliable energy system was implemented. The government vigorously facilitated a dependency on fossil fuel sources, especially petroleum, by authorizing massive foreign loans, grants, and tax incentives for non-renewable fuels. Oil refineries were constructed at important production posts through the alliance of domestic capital and FDIs. Diverse measures were introduced to encourage the consumption of oil products, notably fuel subsidies for investing in the substitution of coal with oil, and free importation of oil using various methods, devices, and equipment. The electric power supply crisis of 1967 and 1968 led to the rapid growth of oil-fired power plants. As a result, the country transformed into a fossil-fuel dependent system (through the ‘oilization’ strategy) compared to previous decades. The country’s dependence on imported energy sources tripled from 12.7% in 1965 to 55.5% in 1973. The composition of oil in the energy mix increased from 12.1% in 1965 to 53.8% in 1973.

Electricity consumption also grew sharply by 22.3% in 8 years over total energy consumption

11.1.3 Emergence of Nuclear Energy as a Major Source

The oil crises of 1973 and 1979 represented a critical turning point in South Korean energy policy. Nuclear energy emerged as a key source for enhancing the reliability and security of the energy mix supporting the country's rising economic development. South Korea already had put in place policies to support the establishment and growth of nuclear facilities. President Rhee Seung-Man, who believed nuclear energy could solve the domestic energy resource deficiency, initiated the development of nuclear power in the 1950s. Starting with a bilateral cooperation agreement on nuclear energy research and development with the United States in 1956, Korea undertook a number of actions to exploit the resource, including joining the International Atomic Energy Agency (IAEA) in 1957, enacting the Atomic Energy Act, and establishing the Atomic Energy Board and the Korea Atomic Energy Research Institute in 1959. With technical support from the U.S., a research reactor was installed in 1962.

Nevertheless, the right conditions for installing and expanding nuclear facilities in the country were not sufficient, due to the huge capital cost and much longer construction period compared to other electricity-generation sources. In the 1960s, two domestic energy crises—the coal supply crisis in the winter of 1964 and the electric power supply crisis in 1967—pushed Korea to change its energy policy. As the Korean government was desperate to develop its energy sector, these energy crises represented a threat to a successful economic take off. The construction of the first nuclear power plant, Kori unit 1 with a capacity of 587MW, was announced in

1968. The construction of Kori unit 1 started in 1978 and was undertaken by the Korean Electric Power Corporation and Westinghouse.

The oil crises emanating from the Middle East provided momentum for the Korean government to intensify its pro-nuclear stance. Threats to stable energy procurement and an oil price hike made the Korean government choose a firm de-oilization policy. These oil shocks contributed to a heightened push to diversify the nation's energy sources. Nuclear energy, which had demonstrated its reliability and security in the international arena, emerged as an ideal alternative. First, nuclear production sites did not need to concentrate in certain regions like oil. Also, the development of the technology could also create positive economic effects on the side. With international oil crises threatening the nation's economic development, the growth of nuclear power plants rapidly expanded during the 1970s and 1980s. The government made it clear in its Five-Year Power Expansion Plans in 1976 and 1981 that nuclear could be an alternative to oil, which contributed 82.3% towards electricity power generation and reached 53.8% of the total primary energy consumption as of 1973. The 1976 energy plan gave rise to the construction of six new nuclear plants, and five more were added by 1981. The geographic nuclear energy landscape of South Korea in the 1980s consisted of four power generation facilities: Kori, Wolsan, Uljin, and Youngkuang. The share of nuclear energy in total electricity generation rose to 53.1% while the oil share fell sharply to below 10% in 1987. As Korea's nuclear energy sector was perceived to be undeveloped at this time, some considered its expansion a great opportunity that would bring a myriad of economic benefits to the country in terms of job creation and expertise development. Consequently, the government implemented an action plan to indigenize nuclear energy technology

during the 1980s and 1990s. Through the Ten-Year Nuclear Energy Indigenization Plan (1986 to 1995), the Korean Standard Nuclear Power Plant Model was developed and self-reliant technological development rose from the initial 60% to 95%. On the basis of self-reliant technological growth, South Korea joined the club of nuclear power plant exporters, which included the U.S., France, Canada, Russia, and Japan, by winning a competitive bid for a 5600MW scale UAE nuclear power plant in 2009.

With the expansion of nuclear energy, the Korean government prioritized coal-fired power plants over oil-fired power plants. Construction plans for oil-fired power plants were canceled and their operations halted. Gas was introduced during this time as another major energy source. In 1980, the government decided to import Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG). The hardship triggered by the oil crisis made the government focus more on strategies to enhance domestic energy security. During this time, the government adopted diverse measures to improve the stability of energy supplies. Key measures included diversifying the energy mix and energy import sources, promoting energy conservation, and engaging in the strategic improvement of oil stockpiles. As a result, the composition of the Korean energy mix drastically changed during this period as shown in Table 11.1. The share of oil, which peaked at 63.3%, was reduced to 43.7%. Bituminous coal, nuclear energy, and LNG filled the gap left by the decreased share of oil and rose as the new major primary energy sources. Despite the diversification of energy supply sources, the sharp increase in energy demand increased the proportion of Korea's dependence on foreign energy sources from 55.5% to 80% in 1973 and 1987, respectively.

Table 11.1: Changes in the Primary Energy Mix between 1973 and 1987

Sources	1973	1987
Oil	53.8	43.7
Anthracite Coal	28.5	19.0
Bituminous Coal	1.7	15.8
LNG	-	3.1
Nuclear Energy	-	14.5
Hydro	1.3	2.0
Firewood and Others	14.7	1.9
Total	100.0	100.0
Overseas Dependence	55.5	80.0

Source: Korean Resources Economics Association & KDI School of Public Policy and Management. (2013)

This trend was more distinctive in the power generation sector. In 1987, nuclear power plants contributed 61.3% to power generation, followed by coal (21.2%). The portion of oil in power generation was greatly reduced by 6.5%. Also, natural gas, a comparatively new energy source in Korea, made notable gains in the power generation sector. Table 11.2 shows the change of energy mix between 1975 and 1987. According to the table, nuclear power substituted large portions of oil and coal, and gas also played a role in reducing oil's share in the power generation sector.

Table 11.2: Energy Mix in the Power Generation Sector of 1975 and 1987

Sources	1975	1987
Oil	80.1 %	6.5 %
Coal	11.2 %	21.2 %
LNG	-	11.0 %
Nuclear and Hydro	8.7 %	61.3 %
Total	100.0 %	100.0 %

Source: Korean Resources Economics Association & KDI School of Public Policy and Management. (2013)

11.1.4 Electricity Market Left under Strong Government Control

In the 1990s, the energy security issue was placed on the back burner, ostensibly due to the advent of low energy prices. With the government's aggressive expansion of energy facilities and the stabilization of the world energy market, Korea enjoyed a decade of abundant, low-cost energy. During this period, the world economic market was undergoing a period of deregulation, and the Korean economy was not spared as the country adopted a wide range of market-oriented mechanisms. Energy sector reforms became a core part of economic restructuring because the energy sector constituted a substantial and vital portion of the Korean economy, both in terms of basic fuel economy and the export market. A notable outcome of the reform was the adoption of new energy pricing mechanisms, which granted the government strict control over this sector, to enhance the nation's industrial competitiveness. The prices of jet fuel and solvent were deregulated in 1983, followed by asphalt in 1988, premium gasoline and naphtha in 1989, gasoline, kerosene, and heavy oil in 1995, and LPG in 2001. In addition, government-owned energy enterprises were privatized and substantial management autonomy was given to public energy corporations. The deregulation of the electricity sector was a major issue of concern. Deregulation ultimately stalled due to opposition from labor unions and civil activists, but not after it left the current electricity market system with six power generation companies, one transmission and distribution corporation (KEPCO), and the Korea Power Exchange (KPX).

In spite of the deregulation in the 1990s, the energy market has remained under heavy governmental control to this day. While the Korean oil industry was significantly privatized and the pricing liberalized, the regulated electricity sector was left intact under government control. Until now, the electricity market operates like a

monopoly under the umbrella of KEPCO, with the government using electricity price as an instrument for advancing economic and social policy development.

Before the GG policy was adopted, the Korean energy policy exhibited strong support for economic growth in spite of continuous reorientations concerning energy mix composition, market structure, etc. Under an international paradigm that sought abundant and cheap energy to fuel material progress, these changes had little impact. Of course, South Korea attempted to make a distinctive and detailed energy governance strategy distinguished by the government's strong grip on the energy market in the tradition of government-led energy development and high reliance on overseas energy sources. Korea imported nearly 100% of its fuel (96.7% as of 2013). Some optimistic experts projected that the factors distinguishing the Korean energy environment could be emulated elsewhere in countries striving for energy independence (Korean Resources Economics Association & KDI School of Public Policy and Management, 2013). The KGGI provides a critical policy and institutional framework for transforming the Korean energy system. The next section examines the panoply of key changes in the Korean energy regime associated with the KGGI.

11.2 Energy Supply Dominated by Abundant Energy Machines

As described in the previous section, energy has been a basic engine for the economic development of South Korea. Under the government's strong will, the country built an abundant energy system at an unprecedented speed to support its economic progress. Table 11.3 shows the status of South Korea's energy regime in 2006, which became the baseline for designing a new energy pathway in the KGGI.

Table 11.3: Korean Energy Status (2006)

	Korea	World	World Ranking	Korea/world Total (%)
GDP (Trillion Dollar/Nominal)	10,118	5,088,010	11th	0.2%
Population (Million)	48.5	6,555	27th	0.7%
Total Primary Energy Consumption (Mtoe)	222.9	11,020.8	10th	2.0%
Electricity Generation (TWh)	403	19,028.1	10th	2.1%
Coal Consumption (Mtoe)	54.8	3,079.5	10th	1.8%
Oil Consumption (Thousand Barrels Daily)	2,320	85,325	7th	2.7%
Natural Gas Consumption (Billion Cubic Meter)	32.0	283.5	25th	1.1%
Nuclear Consumption (TWh)	148.7	2,805.8	6th	5.3%
Hydro Electricity (TWh)	3.5	3043.7	45th	0.1%
Solar-Energy (Cumulative Installed PV Power)	36	6,619	10th	0.5%
Wind-Energy Cumulative Installed Wind Turbine Capacity	194	74,089	23th	0.3%
Dependence on Overseas Energy sources		-	-	-
Energy Intensity (TOE/Thousand USD, the year 2000 constant)	0.347	-	-	-
Carbon Dioxide Emissions (Million Tonnes Carbon Dioxide)	606.0	30,367.9	8th	2.0%

Data: BP Statistical Review of World Energy; World Bank, www.prb.org

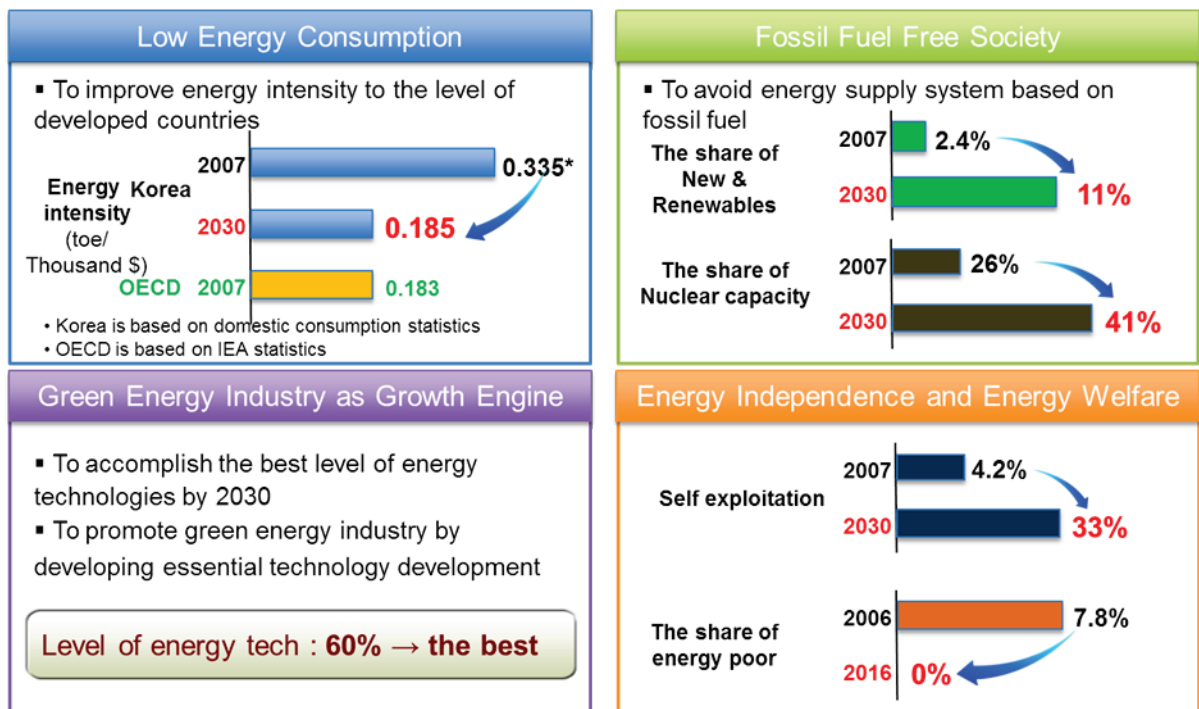
According to Table 11.3, dependence on fossil fuel was significant and nuclear power was a major source of the country's energy mix. Korea's energy consumption ranked 10th globally, despite the country counting for only 0.7% of the world's total

population and 0.2% of the world's GDP. It is a distinctive feature of the Korean case that a lack of domestic energy resources contributed to severe dependency on the overseas energy market. Also, Korea experienced a high level of energy intensity by shifting to a pattern of energy-intensive, industrial-centered economic growth.

11.2.1 Nuclear and Renewables: Key Energy Machines of the KGGI

The implementation of the KGGI that began in 2008 took into account Korea's energy-intensive status. To achieve low-carbon GG, a strong and urgent reorientation of the energy sector and institutional levers supporting economic development was required. The GG blueprint was rooted in the crises that the energy profligate civilization has begotten, i.e. resource depletion and environmental degradation. The paradigm shift relied heavily on formulating a new future energy economy that centered on promoting economic growth while also advancing environmental prosperity. The government focused on energy sector reform in the master plan for GG by promoting de-oilization and energy security. Four key specific targets were identified and implemented: (i) enhancing energy conservation and efficiency, (ii) expanding renewable energy penetration and fostering green energy industry as a new growth engine, (iii) increasing nuclear energy capacity and promoting the global market entry of the nuclear industry, and (iv) overseas resources development for energy security [to secure a stable energy supply].

Widespread implications resulted from an increase in domestic energy, 3.2% in 2006 to 40% in 2030, in the country's largely self-sufficient oil and gas energy market. Figure 11.1 shows the major targets of the first national energy master plan (2008-2030).



Source: Yun. (2012).

Figure 11.1: Major Targets of the First National Energy Master Plan (2008-2030).

A key characteristic of the plan was the selection of nuclear and renewable energies to replace fossil fuels and help reduce CO₂ emissions. Interviewee 6 explained the reasoning as follows:

The energy system transfer is simple. Carbon dioxide is emitted from fossil fuels. The solution to the rapid growth in carbon emissions lies in increasing the composition of nuclear and renewable energy in our total energy mix. Nuclear and renewable are the only viable options at our disposal.

Nuclear energy plays an important role in the new energy plan as an abundant energy machine and reliable base load. The expansion of nuclear thus presents two

strategic meanings: securing the abundant energy regime without fossil fuels and establishing a model case of using nuclear energy to fuel domestic power plants and commercial utilities, as well as developing the attendant value chain in the overseas market. In this regard, the government developed an ambitious nuclear expansion plan, implementing a large scale R&D investment project in the nuclear sector. Table 11.4 illustrates the share of nuclear energy projected to reach 27.8% of total primary energy consumption in 2030, a significant increase compared to BAU. To achieve this target, the government planned to add 12 power plants to the grid.

Table 11.4: Prospect of the Nuclear Portion

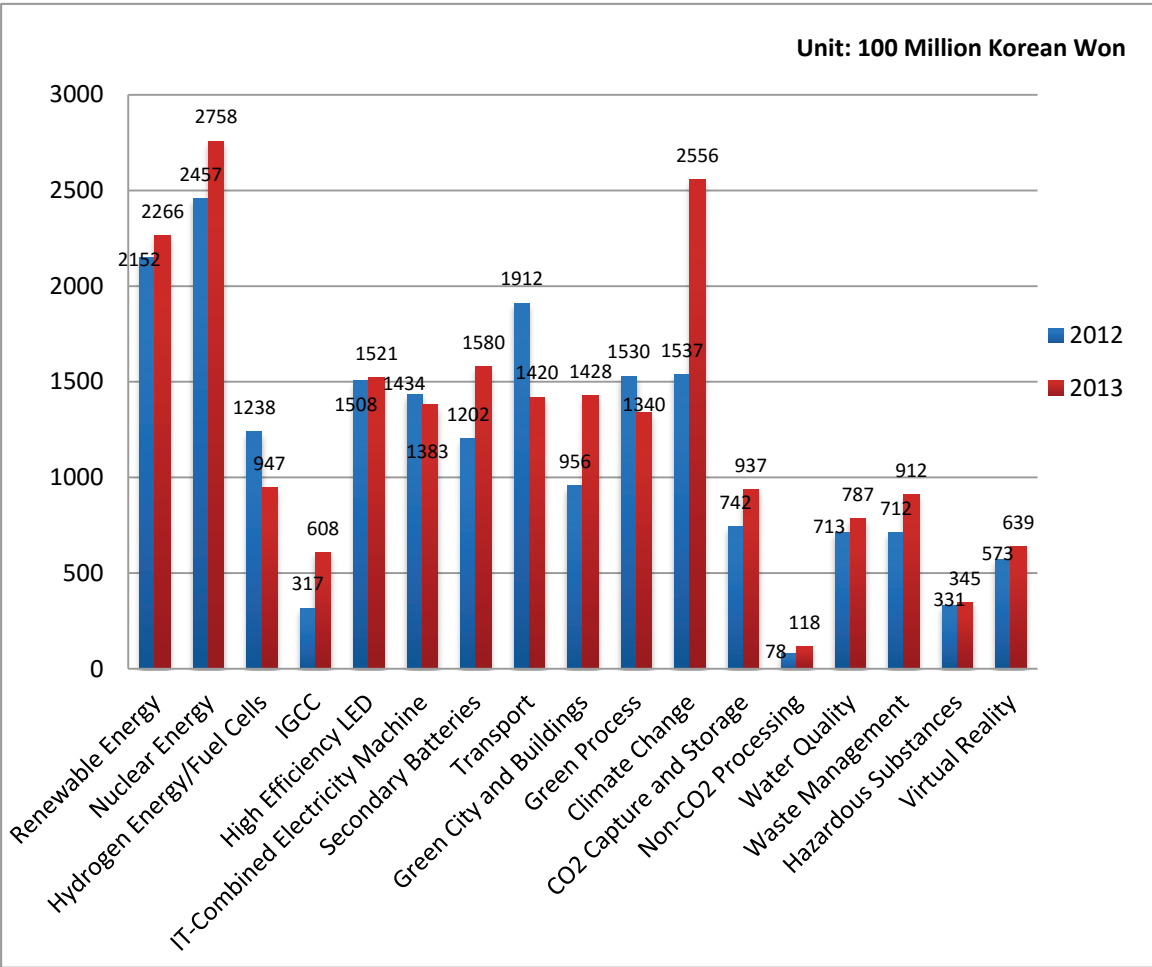
		2006	2020	2030
Total Primary Energy Consumption (Share)	BAU (Thousand TOE)	37187 (15.9%)	57228 (18.4%)	66843 (19.5%)
	Target	37187 (15.9%)	63582 (22.1%)	83420 (27.8%)
Power Capacity (Share)	Target	26%	33%	41%

Source: The government of the Republic of Korea. (2008).

This plan required installing an additional six nuclear power plants that could not be accommodated in existing sites.²⁵ Related to these new installations, the government also funded R&D investment for three nuclear technologies, namely, light

²⁵ As of 2008, Korea held 17715000KWh of nuclear power generation capacity from 20 plant units. These plant units were located in 4 sites: Uljin, Weolseong, Gori, and Youngguang. Additional 9 units were under construction.

water reactors, next-generation fast reactors, and nuclear fusion energy, which constituted a significant percentage of its total green technology R&D investment and totaled about USD 246 million in 2012 and USD 276 million in 2013.



Source: Green Technology Center. (2013)

Figure 11.2: R&D Expenditure by Core Green Technologies (2012-2013).

Despite increased R&D investment and growth in the share of nuclear energy, the expected pathway for creating a nuclear-driven abundant energy machine was

rather too ambitious. The Fukushima nuclear accident in 2011 changed everything, in that it badly damaged the image of nuclear power as a safe, reliable, secure, and low-carbon energy resource. In Summer 2011, Germany revised its plans and decided to phase-out nuclear from its energy mix by 2022. Other major countries also expressed reservations about continuing with huge nuclear investment projects, which resulted in new nuclear plants being canceled, installation plans being halted, and nuclear power being phased-out. South Korea was not spared from this wave of anti-nuclear sentiment, as support for new nuclear installations in the country waned. The nuclear safety-related scandals of 2013 further damaged the credibility of nuclear power in the eyes of the Korean public. In 2013, the construction of high-voltage transmission lines, which the public knew would necessarily be followed by large-scale centralized power generation, became a major issue. The fierce opposition to the construction of the 765kV transmission line in Milyang, which was undertaken to put the Sin-Gori nuclear power plants online, was met with calls to reexamine Korea's nuclear power policy.

These concerns necessitated revising the targeted nuclear energy composition in the second national energy master plan. The share of nuclear in the energy mix decreased from 41% in the first plan to 22-29% in the second, due to factors such as low public acceptance, increased uncertainty in securing stable transmission lines, etc. Nevertheless, the government set a 29% target by 2035, explaining that there was no real alternative to nuclear that could effectively address the triumvirate challenges of energy security, industrial competitiveness, and GHG reduction.

Most of these nuclear security concerns existed before the Fukushima Daiichi nuclear disaster, as there had been a number of well-known accidents including Three

Mile Island and Chernobyl. These previous events ensured the futility of governmental attempts to reassure the public about the safety of nuclear power (Visschers & Siegrist, 2013; Kim, Kim, & Kim, 2013). Opposition to the construction of high voltage transmission lines has been a common source of conflict in mega-scale projects. Despite the shrinking role of nuclear is expected to play in Korea, the GG strategy ironically revealed how the prospective new paradigm still projects a virtue of the old paradigm closely related to the problems of the latter. In other words, nuclear power remains one of the only abundant energy machines capable of facilitating a supply of perpetual and cheap energy. According to the KGGI, renewable energy still needs time to prove itself before it can effectively step into the position formally filled by nuclear power.

11.2.2 Building Green Titans²⁶ for Abundant Energy

In this energy market transformation process, economic efficiency is an important principle that drives the current energy regime. The economy of scale that centralized large-scale fossil fuel and nuclear power plants generated provides the base for the modern system of production and consumption. Modern society's unprecedented economic growth that has been the pride of the Korean civilization over the last six decades has largely depended on the availability of cheap and abundant energy. Relying on nuclear power to reduce CO₂ emissions and climate change therefore represents a compromise between crisis and convenience, as promoted by the PP, rather than a symbol of great transformation. This is real and very

²⁶ Byrne & Toly (2006).

present in government policies and ideas of key officials who have promoted the KGGI.

Nuclear power is the most economic and realistic alternative for the era of high oil prices, need for greenhouse gas emissions reductions, and the desire to guarantee reliability and stability of energy supply (The Master Plan for Energy 2008).

Nuclear does not require additional cost. Also, it is carbon-free. It is the best alternative. Nuclear is cheap, reliable, and abundant. It is a natural conclusion that nuclear has to be a key player of our future energy policy (Interviewee 6).

This belief is deeply rooted in the policymaking practices of economic bureaucrats in Korea. For instance, during deliberations on the second national energy master plan of 2014-2035, many officials and policymakers in different working groups engaged in intense disputes over the ideal share of nuclear in the future energy mix. According to one source, opinions in the working group were very divergent, ranging from 7% to 41%. In the end, 29% was the maximum share that could be agreed upon by the working groups, who were composed of various stakeholders from academia, business, civil society, government, etc. Interviewee 14 provides a fascinating insight into the government's thought process:

There is no choice for the supply of abundant energy in stable and affordable scale but nuclear power. If we give up on abundant and cheap energy, then LNG and renewables can be alternatives. However, to substitute one nuclear power plant, we require nearly 3 bituminous coal power plants, or 10 LNG plants, or 1000 wind farms. While the safety risk decreases, cost increases. People do not like the rise of energy price... The energy mix is very much interlinked with the national industrial strategy upon which our national economic development depends. It results in a significant impact on the energy intensity of our industrial structure.

These viewpoints are the result of certain tenets and principles prevalent in the Korean policymaking arena that have formed over many years. These principles are

passed down in the form of economic development blueprints to enable and sustain the cheap and abundant Korean energy supply. It is therefore possible to conclude that this process is perpetuated by a constant search for cheap and abundant energy to secure continual material progress. Yet this conclusion is natural only when this mono-value is regarded as the absolute truth. The mono-value has become prevalent in modern times, for instance, by equating growing energy consumption with the progress of civilization (Basalla, 1979).

As a result, this preoccupation takes many forms to perpetuate this dominant belief even within the green discourses. For example, decisions on whether to add CO₂ emissions reduction to national targets and policies is determined by the prevailing value system. This shifts the modern value system from the monopoly of material progress to the oligopoly of two absolute values: economic growth and environmental imperatives. Hitherto, nuclear development promises a cleaner energy regime that retains its modern ambitions of bigger, more, and better (Byrne & Toly, 2006). However, the anomalies this new paradigm must contend with are not confined to GHG emissions, as climate change represents only one of the myriad of messes incurred in pursuit of the abundant energy regime. There are a number of concerns associated with nuclear technology owing to security uncertainties relating to terrorism, nuclear disaster, technological failures, radiation leakage, and the secrecy that still pervades the nuclear sector (even more so in South Korea) due to the specialized knowledge and skills required. In addition, other environmental concerns and inequities associated with the abundant energy regime are omitted from the national discourse and policymaking practice.

The promise of the abundant energy machine can also be found in policies supporting large-scale renewable energy development. The Korean government chose renewable energy as a transitional energy resource alongside nuclear power for the planned low-carbon economy. As a result, the policymaking practice, planning, and development of renewable energy in the country have focused on these ‘green titans’ (Byrne & Toly, 2006), cultivated in incubators to be set forth sometime in the future. While nuclear energy is a green titan that can be utilized right now, renewable energy represents a future green energy machine that requires a colossal amount of sustained investment over many decades. Before the KGGI emerged as a national development strategy, the use of renewable energy in the Korea was insignificant. Planning for the increased penetration of renewables into the energy sector followed the oil crisis of 1973, but further focus on renewable energy development waned and investment in the sector was discouraged during the era of low oil prices. As a result, full-fledged renewable energy development was delayed until after the resurgence of high oil prices in the 2000s.

After the 2000s, the interest in targeted renewable energy policy gradually gained center stage in the government’s comprehensive energy plan, following the introduction of programs such as the feed-in tariff (FIT) and Green Home Project. The initial goal of the Green Home Project was to increase the penetration of renewable energy technology, but the objective was further expanded in the KGGI to create one million green homes. Renewable energy policy at this time was small in its scope. However, with the emergence of GG policies at the international level to help address the twin challenges of economic growth and environmental protection, more interest shifted to renewable energy. The South Korean government saw the potential in

developing a domestic renewable energy value chain market, and thus placed renewable energy at the center of its energy policy. An ambitious target for renewable energy was set in the Fourth Master Plan for New and Renewable Energy Technology Development, Use, and Penetration of 2009-2030. The share of new and renewable energy, which represented only 2.37% of total primary energy in 2007, was expected to rapidly expand to 4.3% in 2015, 6.1% in 2020, and 11% in 2030.

Table 11.5: Prospect of the New and Renewable Energy Portion of Total Primary Energy Supply

	2007	2015	2020	2030
BAU	2.37%	3.6%	4.2%	5.7%
Target	2.37%	4.3%	6.1%	11.0%

Source: Ministry of Knowledge Economy. (2008a)

To achieve these targets, the government identified two major policy programs: the Renewable Portfolio Standard (RPS) and the one million green homes goal. The RPS aimed to substitute the FIT that had been supporting the renewable energy power generation business by subsidizing the growing gap between the generation cost and market price of electricity. Under the FIT program, the number of renewable power plants rapidly increased in a very short time. From 2001 to 2011 when the FIT was effective, 2072 renewable energy power plants were installed with a total capacity of 986MW. Of these, 497MW, or 1978 power plants, utilized solar energy.

Table 11.6: 2015 Wind, Solar, and Tidal (Current) Power Plants Installation Plans

(Unit: MW)

	Wind Power	Solar	Tidal (Current) Power
2008	Total 203.5 including Samdal (33) Wind farm complex (14), Yang-gu(20), Jungson(20), etc.	805.2	Uldolmok Tidal Current (1)
2009	Total 327.3 including Gimcheon (97.5), Youngyang (76.5), Milyang (50.6), etc.	143.8	Siwhaho Tidal (254)
2010	Total 110 including MailyangII (60) Sammu offshore (30), etc.	36.1	
2011-2018	Isidol 2012 (42)	28	Garorim Tidal 2012 (520), Wando Tidal Current 2015 (53), Gangwha Tidal 2016 (813), Incheonman Tidal 2018 (1440)
Total	682.8	1,007.8	3081.0
Existing Capacity	191.9	37.8	3081.0

Source: Mistry of Knowledge Economy. (2008b)

However, the government felt that a government-funded FIT would block the growth of renewable energy. To facilitate the development of utility-scale renewable energy plants and circumvent the problem of the FIT's financial limit, the RPS was introduced in 2011. As expected, the scale of renewable energy projects under the RPS expanded rapidly and became much larger than under the FIT. Huge power production corporations that possessed enough upfront capital made plans to increase utility-scale installations of solar and wind plants. Significant growth occurred particularly for wind and ocean energy through the planned utility-scale wind farms on Taebaek

Mountain and offshore sites. Also, tidal power projects were planned as part of a grand vision for producing a level of renewable energy on par with what could be provided by existing fossil fuel or nuclear facilities. This change in scale of renewable energy projects was reflected in the Fourth Basic Plan on Electricity Demand and Supply of 2008-2022, created with input from the KGGI. According to Table 11.6, compared to solar plants that are comparatively small-scale, most wind and tidal power projects are utility-scale plants of a medium or large capacity.

However, the plan to create giant-scale renewable energy was ultimately unsuccessful. While the target of solar power (mainly small facilities) was achieved, many wind and ocean power plant development plans were either canceled or delayed due to a combination of policy, institutional, and financial obstacles. The Garorim tidal power plant of 520MW, which was planned to be operational in 2014, was postponed indefinitely. The 1440 MW Incheonman tidal power plant planned for construction in 2017 was officially put off until the Sixth Basic plan on Electricity Demand and Supply of 2013-2027. Interviewee 13 explains the reason for the failure.

Renewable energy is basically suitable for the decentralized energy system. In this regard, when it comes to large-scale renewable energy development, Korea faces lots of limitations because of its narrow land area, and the mountainous terrain occupying a significant portion of land as well as numerous environmental regulations requirements that have to be met before any development can be undertaken in the terrain. Also, the strengthened environmental awareness of local rights groups near energy plant sites has hampered the installation of large-scale power plants. Under those conditions, the utility scale plants centered penetration policy faced many challenges which have slowed it down.

Energy consumption increased faster than expected between 2007 and 2013 when the government focused on creating green titans to replace fossil fuel energy sources. Moreover, consumption in the industrial sector as a percentage of total

consumption expanded very rapidly. The first National Energy Master Plan (2008-2030) projected the industrial sector's share of final energy consumption to fall from 57.5% to 56.1% in 2012, but the actual share of industrial consumption increased to 61.4%. This result demonstrates that simply changing a major energy source does not necessarily lead to a paradigm shift. As long as the myth of perpetually abundant and cheap energy continues to prevail, it becomes difficult for a new paradigm to emerge.

11.3 Cheap Energy for Industry

11.3.1 Low Electricity Price Policy Created High Electricity Demand

The challenge of designing an appropriate market to ensure the competitive pricing of electricity is a key concern and sensitive subject in South Korea. Since the era of state-led economic development, South Korea's power tariffs—which are below generating costs and about half those of other developed nations—have been held in check by the government. Government's control over this sector has strengthened the nation's industrial competitiveness and supported local manufacturers. The low power tariffs have also encouraged the growth of domestic manufacturers, contributing to rapid economic growth, and increased demand over the years. As Interviewee 15 explains it, “our rapid growth was largely indebted to four factors: low utility prices, well-equipped infrastructure, highly qualified human resources, and the reliable and secure supply of electricity”.

Low electricity prices have caused the KGGI, which calls for comprehensive changes in business practices, institutions, and the current economic structure, some noticeable unease. For instance, the controversy over electricity prices has been one of main issues highlighted in the KGGI's power tariff policy. While the government fears

that higher power tariffs will hurt domestic manufacturers, it also acknowledges that higher electricity prices may help curb power use and promote changes in the energy system.

Table 11.7: Electricity Prices in USD/MWh 2009

Industry			Households		
Ranking	Country	Price	Ranking	Country	Price
31	South Korea	57.8	31	South Korea	76.9
30	Norway	58.7	30	Mexico	79.9
29	Canada	61.2	29	Canada	83.0
27	USA	68.1	28	USA	115.1
19	France	106.7	26	Norway	132.6
14	UK	134.3	22	France	159.2
8	Germany	139.6	16	The UK	191.2
5	Japan	157.8	9	Japan	227.6
3	Ireland	169.0	3	Italy	284.2
2	Slovak Rep.	194.8	2	Germany	317.9
1	Italy	276.1	1	Denmark	364.8
	OECD Avg.	106.7		OECD Avg.	155.5

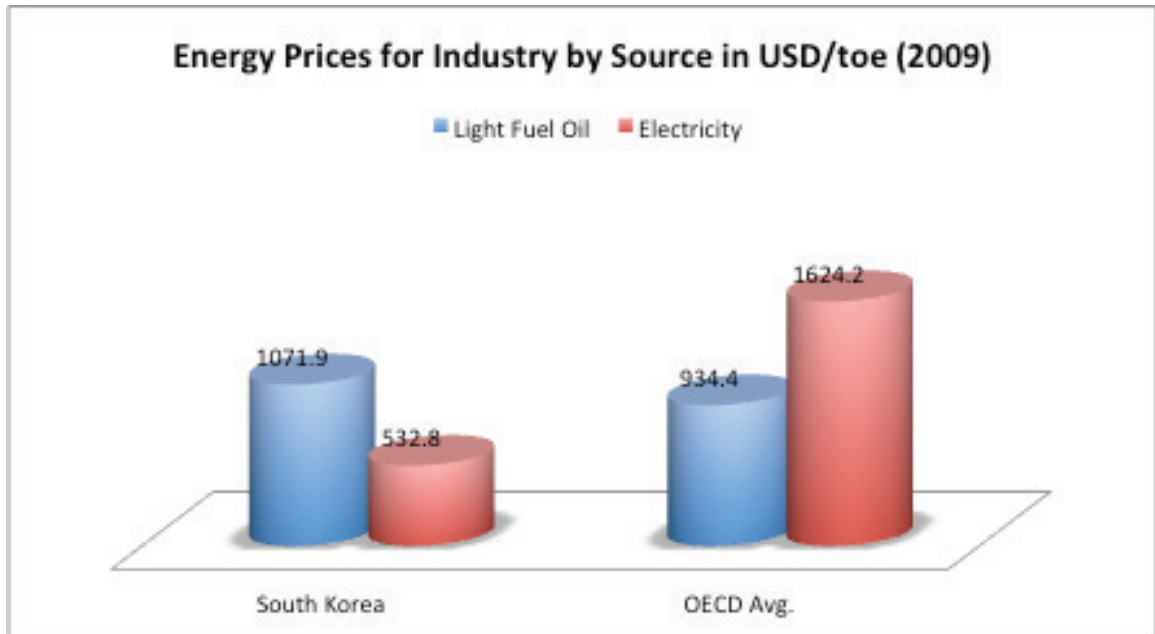
Data: IEA (2013).

In this context, electricity-pricing policy has become a symbolic battlefield between a prospective and existing paradigm. This situation is further complicated because the electricity price involves political considerations aside from industrial and economic concerns. Factors such as equity, politics, and favoritism have made the equitable pricing of electricity even more complex. Because democratization has permeated society in the recent past and Korean citizens have been granted more rights, maintaining the wide electricity rate disparity between the industrial and

residential sectors has become more difficult. In other words, both political and economic power conflicts are affecting electricity prices. Although increasing electricity prices was an inevitable condition of paradigmatic change, the factors associated with this change were increasingly unfavorable.

Table 11.7 shows South Korea's electricity prices relative to other OECD countries in 2009—the second year after the KGGI was launched. Of the 31 OECD countries, South Korea had the lowest prices in both the industrial and residential sectors. As a result, the electricity market faces a diverse set of market distortions arising from power tariffs that do not accurately reflect generation costs. This has led to huge losses for KEPCO, the state-run power company.

The most conspicuous Korean paradox was a cost reversal between primary energy and secondary energy (electricity) generated from primary energy. Figure 11.3 illustrates South Korea's electricity price is relatively cheaper compared to the OECD average. Also, unlike the OECD average, South Korea's electricity price was much lower than a primary energy source (light fuel oil) usually used for heating.



Data: IEA. (2013).

Figure 11.3: Energy Prices for Industry by source in USD/toe 2009.

South Korea's abnormally underpriced power tariffs have led to a shift in electricity demand that has resulted in higher rates of electricity consumption. For instance, many buildings have converted to using electricity for heating and air-conditioning during the last decade. A steel company using an electric blast furnace provides a poignant example of the electrification phenomenon that this abnormal electricity price has brought forth. According to Table 11.8, South Korea's electricity consumption in the industrial sector per capita ranked 7th within the OECD in 2009. Korea's rank in terms of industrial consumption against GDP rose up to 4th position in 2009. Interestingly, this sharply contrasts with the consumption trend for the residential sector. In the same year, the electricity consumption of Korean households

ranked 27th among the 31 OECD countries. Korea placed 26th for electricity consumption against GDP.

Table 11.8: Ranking of Electricity Consumption per Capita 2010

(Unit: kWh/per Capita, Indexed against Korean Consumption)

	Industry			Residential		
	Ranking	Consumption	Times*	Ranking	Consumption	Times*
Korea	7 (4)	4,617	1.0	27 (26)	1,240	1.0
Norway	2 (3)	9,096	2.0	1 (1)	7,900	6.4
Germany	13 (19)	2,756	0.6	19 (25)	1,733	1.4
USA	12 (23)	2,843	0.6	2 (6)	4,674	3.8
Iceland	1 (1)	43,260	9.4	12 (14)	2,107	1.7
UK	25 (32)	1,703	0.4	14 (21)	1,935	1.6
Italy	20 (21)	2,114	0.5	28 (29)	1,150	0.9
Japan	15 (18)	2,605	0.6	9 (9)	2,384	1.9
Canada	6 (7)	4,868	1.1	4 (4)	4,311	3.5
France	23 (29)	1,866	0.4	8 (8)	2,582	2.1
Australia	9 (15)	3,360	0.7	7 (11)	2,698	2.2
OECD (Avg.)	-	2,445	0.5	-	2,448	2.0

Source: Jeon. (2013).

() Ranking at the electricity consumption against GDP

* Indexed against Korean consumption

In addition, the industrial sector took up more than 50% of the country's electricity consumption, a share that is gradually increasing each year. According to Table 11.9, the share of industrial electricity consumption was 50.1% in 2006 and rose to 53.2% in 2011. Contrary to this, the residential share of electricity consumption decreased from 15.1% in 2006 to 13.5% in 2011.

Table 11.9: Electricity Consumption Trend by Sector 2006-2011

(Unit: GWh, %)

Year	Residential		Business Use		Industry		Total	
2011	61,564	(13.5)	151,302	(33.3)	242,204	(53.2)	455,070	(100)
2010	61,194	(14.1)	149,795	(34.5)	223,171	(51.4)	434,160	(100)
2009	57,595	(14.6)	139,135	(35.3)	197,744	(50.1)	394,475	(100)
2008	56,228	(14.6)	134,212	(34.9)	194,630	(50.5)	385,070	(100)
2007	54,174	(14.7)	128,180	(34.8)	186,252	(50.5)	368,605	(100)
2006	52,522	(15.1)	121,536	(34.9)	174,661	(50.1)	348,719	(100)

Source: Jeon. (2013).

() Share of each sector

11.3.2 Electricity Price Disparity between Industry and Households

Despite the fact that both the residential and industrial sectors have underpriced electricity, the residential sector has some peculiar characteristics that greatly affect the nation's energy regime and strategies for helping the sector achieve a low-carbon pathway under the KGGI. This phenomenon arises mainly from the inequity of price differentials between the two sectors. Some policymakers and analysts argue that the residential-industrial price disparity is the standard across other global energy markets, and to be expected as the cost of electricity generation for the industrial sector tends to be lower.

However, while this scenario may be true for other markets, the Korean case has its own unique characteristics that serve to reinforce the nation's undemocratic pricing tendencies. This discrepancy arises from Korea's use of excessive progressive rates in residential electricity prices. The inverted block rate structure used in the residential sector was introduced during the first oil crisis in 1973. As of 2013, there

were six segments of electricity for the residential sector. These segments were applied in the sector with different rates. Table 11.10 demonstrates the electricity tariff for South Korea’s residential sector. South Korea’s energy sector adopted an 11.7 times progressive rate, which is a rare case in the global electricity market. Many countries utilize the inverted block rate structure, but only in a limited scope and using a narrow progressive rate range. Table 11.11 lists various progressive rates for residential electricity. Aside from Korea, Taiwan’s progressive rate is the highest of all countries at 2.7 times. The extreme inequality in pricing across segments in South Korea has been justified through a policy imperative of energy conservation and equity among different income brackets.

Table 11.10: Electricity Tariff for the Residential Sector (Low Voltage)

(Unit: South Korean Won)

Blocks	Electricity Consumption	Tariff
1	Below 100kWh	59.10
2	101-200kWh	122.60
3	201-300kWh	183.00
4	301-400kWh	273.20
5	401-500kWh	406.70
6	Over 500kWh	690.80
Progressive Rate*	-	11.7 times

Source: Jeon. (2013).

* Progressive rate means the proportion of the tariff at the lowest level against the highest level.

Table 11.11: Progressive Rates of Electricity for Residential Use

Country	Company	Segments	Progressive Rates	Date of Enforcement
Korea	Korea Electric Power Corporation	6	11.7 times	01-14-2013
USA	PSE&G	2	1.1 times (Summer season) Unit rate (Other seasons)	01-01-2010
	Duke Power	2	1.3 times (Summer) 1.12 times (Others)	02-01-2010
	PG&E	5	2.6 times	01-01-2013
UK	EDF Energy	2	0.61 times	10-02-2009
Japan	Tokyo Electric Power Company	3	1.5 times	07-10-2012
Taiwan	Taiwan Power Company	5	2.7 times (Summer) 2.1 times (Others)	01-14-2013

Source: Jeon. (2013)

This policy has been criticized for perpetuating inequality between industry and households, in that the responsibility for conservation was shifted mostly to general consumers. Additionally, some have cast doubts on the policy's self-proclaimed focus on equity if household consumption amount is considered. It is known that income level is a key factor that determines the amount of electricity consumption. Korea's progressive rate structure can easily be viewed as unreasonable simply by comparing the energy use of single households with high income to that of multiple households with low income. Recently, harsh weather events attributed to climate change have increased the electricity demand for weatherization during the summer and winter seasons. As a result, many regular middle class households

suffered from the ‘bomb of electricity bills.’ This situation has reinforced the push to reform the country’s electricity pricing scheme, in addition to strengthening perceptions on the existing price disparity between industrial and residential users. Generally, household electricity prices in South Korea have been perceived as cheap, yet the evidence reviewed for this analysis would suggest otherwise considering the excessively high progressive rate.

11.3.3 Failure in Normalizing Electricity Price: Power Conflict Inside Government and Strong Resistance from Vested Rights

It is therefore imperative for the KGGI to correct these market distortions by prioritizing the immediate reform of the electricity sector as a strategy for setting Korea on a sustainable energy pathway. Reforming the sector could include measures aimed at curtailing excessive industrial electricity consumption, removing the government’s overemphasis on macroeconomic concerns, managing political interference, and addressing the inequality issue. The government should phase-out fossil fuel subsidies and use electricity tariffs to promote the penetration and diffusion of clean energy technology investment and deployment. The competitiveness of new and renewable energy sources, which still face higher capital and transaction costs than fossil fuels, can be hampered by the low electricity prices. Electricity prices were adjusted seven times during the Lee Myung-Bak administration of 2008-2013, but the increase was not enough to lead to a fundamental change in the energy regime. The rate increases rolled-out in the industrial sector were relatively higher than the other sectors. As a result, the ratio of the cost of electricity for industrial use compared to residential, only 58% in 2008, increased to 75% as shown in Table 11.12. Nevertheless, the persistent wide gap in tariffs between industrial and residential users

can be blamed on Korea’s policy environment, which has seen a great amount of competition among diverse conflicting interests.

Table 11.12: Korean Electricity Price by Sector 2008-2013

(Unit: South Korean Won/kWh, %)

Year	Residential	Commercial	Industry	Agriculture
2012	123.69	112.50	92.83	42.90
	(100)	(91)	(75)	(35)
2011	119.99	101.69	81.23	42.72
	(100)	(85)	(68)	(36)
2010	119.85	98.93	76.63	42.54
	(100)	(83)	(64)	(35)
2009	114.45	98.50	73.69	42.13
	(100)	(86)	(64)	(37)
2008	114.97	95.30	66.24	42.38
	(100)	(83)	(58)	(37)

Data: The Korea Energy Economics Institute. (2014b).

(Portion of each sector’s price against residential sector that is set as 100%)

Calls to increase electricity prices faced strong opposition from a diverse set of stakeholders. The strongest opposition came from the Ministry of Finance and Strategy that deals with the price index and macroeconomics. Traditionally, the authority has maintained a conservative position when it comes to raising public utility fees due to concerns over inflation and industrial policy (Chung and Park 2010). This conservative tendency was further strengthened during the Lee Myung-Bak Administration because the government’s core agenda was to stabilize the consumer’s price index—a key agenda of the Administration equivalent to the KGGI. In addition,

the Ministry of Finance and Strategy is responsible for setting the public utility rates in the country as an increase in electricity price most likely entails an overall rise in the price of commodities, as higher electricity prices raise industrial production costs.

Interviewee 3 expresses the concern as follows:

We had to seriously establish the energy mix taking the economic and industrial structure of Korea into consideration. It had to meet two conditions of price and CO₂ emissions reduction. More specifically, we needed alternative energy sources that made it possible to keep electricity price at a proper level.

During the Lee Myung-Bak Administration, two inconsistent policies coexisted creating even further confusion. One party called for increases in electricity prices while other parties vehemently opposed the measure. Byrne et al. (2014) have opined that this paradigm of “more is better” creates a profound conservative tendency—a “dynamic conservatism”—whereby alternative futures are viewed from the prismatic vantage point of the stable state. Thus, despite changing circumstances in global energy markets that lead to the historically high oil price of USD 140 per barrel in 2008, the government decided to freeze utility prices and instead extend huge subsidies of about USD 1,255 million to the Korea Electric Power Corporation (KEPCO) and the Korea Gas Corporation (KOGAS) to offset the deficits arising from the gap between production cost and market price. The subsidy program was included in the supplementary budget bill in the summer of 2008 in response to economic difficulties associated with high oil prices. In summary, the oil crises provided a critical excuse to extend the era of unreasonably low electricity prices with enough justification and less resistance.

However, economic and political factors underlying the South Korean electricity market also contributed to the decision to subsidize the industry through

low electricity prices. A statement by Interviewee 10, who is conversant with the situation, confirmed the conflicting views of price index and energy authorities.

We tried to discuss about the rate increase with the Ministry of Strategy and Finance. Yet, the ministry, which was the authority dealing with the consumer price index, made a decision not to permit the rate increase. Instead, it chose an alternative option to compensate the deficits of KEPCO and KOGAS due to the increase of cost with tax money. They pushed us to request budget for the subsidy at the 2008 supplementary budget bill. We didn't like it but we couldn't help but accepting that decision.

Nonetheless, the official also added a strong objection, explaining that the decision as follows:

It can be compared with making a right turn while signaling a left turn indicator. It was definitely incoherent with Green Growth. The 9.15 Blackout of 2011 was a result of that incoherent policy. The conditions for the supply expansion policy were not favorable. In addition, the demand-side management realized bad performances due to the low electricity price. At every peak season, nation had to be in the power emergency system by the shortage of power reserve.

The Ministry of Knowledge Economy (later renamed the Ministry of Trade, Industry, and Energy) was then in charge of the industry and energy policies and focused mainly on increasing electricity prices and liberalizing the electricity market. The policy outcomes and challenges faced by the industry while under the full control of the Ministry confirmed the majority of people's fears that public power tariffs in South Korea should not be unreasonably low nor controlled by the state. This confidence in facilitating an active energy sector originated from the desire to position the industry as a growth enabler in the new global climate economy. Some policymakers also assumed that the well-established core export industries in the country, which were mostly high-energy intensive industries, would suffer only minor damages as a result of the high power tariffs. Consequently, they estimated that low

electricity prices would be an obstacle to developing a vibrant energy sector and assumed the impact would be largely negative for the national economy. A comment by Interviewee 6 captures these deep-seated policymaking concerns at the Ministry of Knowledge and Industry:

Electricity is too cheap. Electricity charge doesn't cover the cost of production. It is possible because a government-owned company like the KEPCO monopolizes electricity supply. The Ministry of Strategy and Finance holds the authority to manage consumer's price index. They always want to freeze electricity price despite obvious factors of rate increase. Public utility rates are basically political issues. People don't like the price increases... Despite a big fuss about the electricity price issue of business, the portion of electricity bill is slight out of total cost.... The [energy] consumption never decreases if the rate doesn't rise. The authority of consumer's price index considered only consumer's price index. They thought that Green Growth and the utility rate were separated issues.

Other stakeholders, however, expressed different perspectives from that of the energy authority. For instance, the associations of businesses were strongly opposed to raising power tariffs. As Interviewee 16 argues,

Businesses oppose the increase of electricity rate because it's costly. Industry rate is lower than residential and commercial sector though general people share the favor to industry. The cost of industry is ultimately transferred to people... If the KEPCO doesn't recover its cost through sales, the rate has to be realized anyhow. However, [in order to increase the rate] first of all, the cost recovery rate of the KEPCO has to be declared transparently. We don't believe the cost recovery rate that KEPCO provides. Also, there is a doubt about if KEPCO reduced cost as much as they could. The electricity market is monopolized by the KEPCO. Consumers cannot move to other choices. In this situation, KEPCO is not declaring their cost structure.

The electricity price issue also became entangled with broader considerations. Traditionally, the Ministry of Knowledge and Industry has shared the same policymaking practices as the Confederation of Korean Industries for most industrial

policies, but the two bodies had conflicting and diametrically opposed positions on the utility rate issue. These opposing positions can be explained by considering the different attributes of the Green Growth strategy compared to traditional industrial policy issues. GG seeks to create economic opportunities while transforming the environmental and ecological integrity of the production system, practices, and lifestyles. Because of the decoupling strategies required, industries in some traditional sectors are forced to sacrifice their current growth prospects in order to achieve desired future objectives, while other sectors might register continued progress into the future. In practice, however, business associations have spoken for traditional industries rather than for the comparatively new pro-green businesses. This was a natural result of high pollution industries having control over the power of business associations, and echoes the economic structure of the Korean economy that has been led by export-oriented heavy chemical industries.

Because the various stakeholders possessed diverging opinions on power tariffs, rising utility bills remained a contentious issue and a source of constant power conflicts in the sector. Interviewee 1 highlights this concern as follows:

A drastic reform of price, taxation, and financial system was needed from the perspective of Green Growth. Nevertheless, why wasn't the change drastic? Whenever the specific reform was initiated, strong checks were intervened from parties who were dealing with current issues such as economy, politics, etc. The electricity price inherited from the previous government was 78 percent of production cost. Even though increase rates were very low, we made the increase of electricity price 7 times real. As a result, it came to reach 95 percent of cost at the end of the Lee Myung-Bak administration. We tried to place it on the top priority of policy actions to rationalize the electricity price to lead the change of market. It was the outcome obtained through big fights with economic bureaucrats and situations.

The delay in realizing a competitive electricity price worsened the distortion in the Korean energy market as evidenced by the blackout that followed in the summer of 2011. Since the 2011 blackout, an electricity crisis caused by the shortage of adequate electricity reserves has occurred almost every summer and winter in Korea. Frequent failures of old nuclear power plants and ‘scandals’ related to nuclear facility safety have only aggravated the situation. The government did not envision these problems because a competitive power tariff was strongly recommended by many experts as the direct and fundamental solution to the existing electricity market distortions. Creating a more rational network energy price was also included among the ten main tasks of the first national energy master plan of 2008-2030. As Chung and Park (2010) explain, the unreasonable power tariff has brought many problems, including high electricity consumption by energy intensive industries, worsened inequity through cross subsidies among sectors, and affordability concerns from the intransigent inverted block rate on households.

11.3.4 Not Transformation But Compromise: Providing Favors to the Parties Responsible for Causing the Electricity Crisis

Countermeasures undertaken by the government to ameliorate the situation turned out to be short-lived, thus preserving the same undemocratic pricing tendencies these reforms sought to correct. For instance, one of these initiatives included a subsidy for big electricity consumers participating in the emergency adjustment program of electricity demand and supply. This program subsidized huge customers who reduced their energy consumption over a certain level during peak periods. Companies could also qualify for the subsidy by supplementing their consumption with self-generated power through net metering. This program, which cost the

government about USD 828 million from 2011 to 2014, only succeeded in deepening inequality and injustice in the energy market by advancing favors to the same people responsible for causing the electricity crisis. An October 12, 2012 newspaper column in Chosun-Ilbo written on the basis of a document distributed by a Korean representative Park Wan-Joo revealed that the largest individual subsidy of USD 38 million was paid to Hyundai-steel Co. as of first half of 2012. The large subsidy covered 10.33% of the company's approximate USD 730 million annual electricity bill. Furthermore, nine of the top ten subsidy beneficiaries were from the steel industry, including Korea Zinc Company Inc., KISCO, Korea Steel Shapes Company, POSCO, and Daehan Steel Company, among others. Of the top 30 beneficiaries, 17 were steel manufacturing companies and 7 were cement corporations, which both represent high-energy intensive industries. It was also the case that some companies received subsidies greater than what their electricity bills cost, such as Korea Steel Shapes Co. that received USD 6.3 million in subsidies compared to a USD 3 million electricity bill in May 2012. In addition, KISCO paid about USD 4.6 million in bills and obtained about USD 7.4 million in subsidies.

Aside from steel and cement companies, private power plants also benefited the largest from rising electricity consumption. South Korea's base load is covered by six public power generation subsidiaries of KEPCO. The System Marginal Price (SMP), which represents the production cost of the most expensive power plant in any time zone, is the baseline for Korean electricity prices. While the SMP becomes the electricity price of private facilities, the electricity price of the six public power generation companies is set at a discounted SMP. This adjustment factor has created

further disparities in the electricity market and has been criticized for its irrationality.

As Lee (2013) notes:

The government has changed upper limit prices and adjustment factors more frequently and intervened in regulating the revenues of generation companies in an ex-post manner, resulting in the inefficient operation of power plants. As a result, since the inception of CBP in Korea, the shortage problem of base load facilities is not improving but rather worsening and the balance of supply and demand is also being delayed (2013, p. i).

The arbitrary price control mechanisms applied in the electricity market were put in place to maintain low electricity prices. Price adjustments helped make the electricity market more attractive to private companies, most affiliated with conglomerates, and enticed them to enter the market in search of better returns on investment. This turned out to be an intelligent move on their part, as the majority of these private power companies accrued significant profits this way. According to a document released by the Korean representative Hong Il-Pyo in 2011, the operating profit of five private power companies, including SK E&S, POSCO Energy, GS EPS, GS Power, and MPC Yulchon, amounted to nearly USD 6,758 million. In the first half of 2012, the top three companies—SK E&S, POSCO Energy, and GS EPS—earned about USD 385 million in operating profits.

As a result, the biggest beneficiaries of the low electricity prices were the large and well-established companies. Although most electricity price increases targeted the industrial sector and not residential consumers, most of these price adjustments were relatively puny. Ultimately, the persistent distortion of electricity prices preserved the prevailing low power tariff regime. Interviewee 18, an energy expert who helped formulate many of the energy policies during this period, observed that:

The government's will to support industry was strong and obvious. Cost due to this support was borne by the general citizens. There wasn't any change in the paradigm. Pursuing the effects of a paradigm shift without paradigm change led to emergence of new programs and institutions. These programs were introduced in an ad hoc manner and on a regular basis (Interviewee 18).

Despite the government's attempts to justify the low electricity price as a means of improving the quality of Korean living standards, the electricity tariff disparity between households and industry, in which the average price of residential electricity does not reflect the actual prices due to an excessive inverted block rate structure, results in the low electricity price unfairly subsidizing businesses. If the KGGI causes a paradigm shift concerning the power tariff, the present circumstances of the energy sector—i.e., an upsurge of industrial electricity demand and a regulatory environment that prevents renewable energy from favorably competing with fossil fuels—will not allow for the kind of transformation in the energy market as envisioned in the economic blueprint. Rather, market distortions, political interference, and electricity price controls will only entrench the desire for a perpetual abundant energy regime in spite of the KGGI's efforts to send the energy sector down a low-carbon pathway.

11.4 Failed Revolution Due to Adherence to Abundant and Cheap Energy

The modern energy system has underpinned industrial development by providing an abundant and cheap energy supply. As seen in Basalla's energy-civilization equation (1979), the progress of civilization has been linked to its energy consumption. Developed countries established large-scale centralized energy systems to secure abundant and cheap energy supplies and enjoy the material affluence that the system supports. South Korea started its economic development late and put a great

deal of effort into establishing a solid energy supply system. A stable energy supply was a key factor in the economic success for Korea, as the country relied on energy guzzling, export-led industries to achieve growth. Also, as a catch-up country that was far behind much of the world in terms of market competitiveness, cheap energy became a critical factor in ensuring that domestic businesses could compete on the international market. In this context, the Korean government controlled the energy market and invested in building large-scale energy facilities including nuclear power plants. By exerting a strong grip on the energy market and creating pro-business energy policies, the government has maintained a market environment that has been favorable to industry. Thanks to a cheap and abundant supply of energy, the energy intensity of Korea is higher than most OECD countries²⁷. In addition, the excessive intervention of the government in the electricity market is generating distortions such as excessive electricity demand, the electrification of the industrial and commercial sector, and inequality between industry and households.

In this situation, a revolution in the energy market became a critical goal of the KGGI. If the belief that the amount of energy consumed determines the level of humanity's well-being, it is difficult for any critical change to happen. However, instead of challenging this fundamental equation, the Korean government adhered to the belief that an abundant and cheap energy system would drive progress. In spite of the argument that the KGGI represented a paradigm shift, Korean energy policy remained locked in the realm of conventional wisdom and prescriptions for energy crises were based on the old tenet.

²⁷ In 2010, Korean energy intensity ranked 5th among 34 OECD countries with 0.2035, which is much higher than OECD's average 0.1637.

Nuclear and renewables, chosen as the main energy sources during the time of crisis, only perpetuated the abundant energy system that had previously been powered by imported fossil fuels. In other words, these energy sources were viewed as good inputs for feeding the energy-civilization equation. Despite various potential and realized problems with nuclear energy, including accidents related to nuclear power plant meltdown, inequity generated by centralized large scale energy system, etc., nuclear energy was chosen as the most realistic energy source that could fulfill the desire for energy abundance and quickly reduce CO₂ emissions at the same time. This choice has a decisive impact on the KGGI being viewed as a paradigm shift. Namely, it is reducing the current crisis only to the problem of excessive CO₂ in the sky and ignoring the holistic problems that humanity's belief system, lifestyle, and political economic power structure have created. If the current crisis is a one-dimensional issue limited to CO₂, then the solution does not call for a paradigm shift.

The choice to promote renewable resources as a key energy machine is revolutionary on the surface. The share of new and renewable sources in 2007 was only 2.4% of primary energy supply. The Korean government aimed to raise this share to 11% by 2030. This target required a holistic change in the production, distribution, and consumption of energy. Instead, the path the Korean government chose was to produce a clone of the conventional energy system while utilizing renewable sources. By introducing RPS instead of FIT that had supported the expansion of renewable energy market, the Korean government made it clear that it sought to replace the renewable energy market that had been led by small and decentralized plants with utility-scale plants of a medium or large capacity. Thus, the increased focus on renewables was a change only in the means of energy production. Consequently, as of

2015, no change has been observed in the Korean energy market. Energy intensity is still growing and the penetration of renewable energy is limited. Most of the utility scale renewable energy projects that the government planned for the KGGI have fallen through.

The energy system centered on nuclear power and utility scale renewable energy are “green titans” intended to perpetuate the abundant energy system. The switch of key players from fossil fuels to the so-called greens left the embedded beliefs and normal operating system untouched; it did not result in any meaningful change. The KGGI demonstrates that the green titans strategy was not even effective at reducing CO₂ emissions, let alone any of the other, more vexing problems that the modern energy system generated.

In addition, the cheap energy that has bolstered the industrial economy along with abundant energy has begotten a myriad of socio-economic effects. Most notable among them is the phenomenon of inequity among economic players. The pricing structure of energy initially favorable to industry transferred the burden to individual consumers. Although it has been pointed out that the unreasonably low and artificially controlled electricity price is a main contributor to the distortion of energy market by countless professionals, the Korean government failed to bring about significant change to rectify the situation. This inaction mainly stemmed from power conflicts inside government and strong resistance from industry.

The analysis of the Korean energy system in this chapter leads me to conclude that the KGGI is not a paradigm shift, at least as it concerns the energy system. Even though the initiative pursued a paradigmatic change, it did not create any meaningful transformation by adhering to the conventional belief and power structure.

Energy policy could be the most critical means of stopping human civilization from marching towards a tragic ending. Although the KGGI has ended, the Korean government continues to push for a reform of the energy system by stressing the importance of clean energy and energy efficiency. However, the shape of the current Korean energy system suggests that a policy shift is far away. The Korean government anticipates that the total capacity of domestic power plants will go beyond 100 GW in 2016. Furthermore, increased coal generation is leading the expansion of these power plants' capacity, despite energy market trends which are moving away from coal (Noh, January 25, 2016). The percentage of renewable energy to total primary energy consumed remains very low by OECD standards: only 1.6% in 2014. In addition, although the abnormally low electricity price has fostered overconsumption and been a key factor in problems such as the 2011 blackout, the KGGI has paid little attention to normalizing the electricity price because it clashes with the government's goal of maintaining a low price index to support the competitiveness of domestic industries. For these reasons, I cannot say that GG has brought forth a meaningful policy shift in the energy field. The PP continues to define the course of Korean energy development.

Chapter 12

CONCLUSION

This chapter concludes the dissertation by summarizing its findings and offering a view of the challenge to theory and policy in light of these findings.

12.1 Summary of Discussion

12.1.1 Core Elements of the Progress Paradigm: Benchmarks for Paradigm Comparison

The dissertation utilizes five core characteristics of the existing paradigm that GG is meant to replace. These characteristics serve as the benchmarks used to compare the two paradigms and determine whether a shift has taken place. The most predominant characteristic of the existing paradigm is the belief that material growth is progress *per se*. A constant striving toward affluence is the key ideology that undergirds the modern paradigm. Rising doubts about this ideology undermine the foundation of this prevalent paradigm, which supports the other core characteristics.

The technological progress witnessed in the modern world has generated confidence in the idea that material growth is progress. Technology is believed to be a panacea for every affliction facing humanity. The technological optimism that has continued since the era of the industrial revolution has been strongly rooted in the minds of modern humans. The unprecedented level of affluence experienced in the contemporary world has been attributed to technology progress. Humanity retains its unwavering faith in technology, even to the point of offering technological solutions to

major environmental and social crises that were partially engendered by modern technology.

Technology played a crucial role in allowing humans to have mastery over nature, which granted people the unlimited ability to exploit nature for the purpose of material expansion. Before modern society, humanity comprised just one part of an organic whole; but this relationship became completely different in the modern world. In the modern world, humans exist independently outside the organic whole and are able to exert full control over the natural system. In this milieu, there are no limits to how far humans are able to manipulate and utilize nature; indeed, everything in the natural world is seen as existing for their convenience. This change in the human-nature relationship that occurred during modernity has, in part, sanctioned the use of technology to remove any natural obstacles that could hinder the satisfaction of human desires.

The rise of coalitions of state and business actors has become a generalized phenomenon as countries attempt to create the best environment for achieving sustainable economic growth. In the modern political milieu especially, the continuation of political power relies heavily upon the economic performance of the ruling clique. As such, support for big businesses that greatly influence the GDP growth of countries has become a top priority for governments. Although the level and intensity of the coalitions that are formed between the state and businesses vary according to the differences in political systems amongst different countries, it is nonetheless common for many countries to apply strategic plans and economic policies to help domestic businesses.

Experts and bureaucrats are the actors who are primarily responsible for governing this modern system. The authority of these two main types of agents derives from their reputed proficiency in their specific professional occupation. Experts and bureaucrats are departmentalized according to their area of focus and monopolize the decision-making that takes place in their realm. The rule of experts and bureaucrats has been effective in increasing efficiency and contributing to the creation of affluent societies. However, this material wellbeing has also come at the cost of human autonomy—which is to say that regular people have been excluded from the decision-making which serves to regulate their lifeworld. Ordinary people, who are not considered experts or competent bureaucrats, are given no say over the way that their society’s resources are distributed, nor do they have any part in the institutional changes that affect official and unofficial life. Mumford illustrated the situation with the concept of the “authoritarian-democratic contract” (1964). This concept succinctly captures the common experience of living in modern society, which entails that democratic freedoms must be surrendered for the sake of achieving a standard of efficiency and optimality set by a professional elite class.

The modern energy system is a critical exemplar that showcases all of the PP’s core characteristics. Basalla (1979)’s energy-civilization equation plainly illustrates how the “more is better” ideology is reflected in the modern energy system. According to Basalla, modern society believes that greater levels of energy consumption will result in greater levels of (economic) prosperity for civilizations. As a result, modern societies have universally attempted to create cheap and abundant energy systems—which historically have relied primarily on fossil fuels like coal, oil, gasoline, and natural gas—to support economic growth centered on GDP expansion. However, the

cheap and abundant energy system could be sustained in the long term only through the development of complex energy technologies, the ever-growing complexity of which has resulted in the continual expansion and clustering of energy facilities. The application of atomic technology to power generation has spurred electricity generation on a massive scale, further solidifying the centralization of the modern energy system.

Humanity has attempted to resolve the environmental crises caused by the overuse of fossil fuel energy sources by using scientific techniques to manipulate nature, i.e., they have focused on trying to replace non-human nature with scientific nature. The development of carbon sequestration and clean coal technology exemplify how science is attempting to extend the life of the existing modern energy system without sacrificing its ability to generate cheap and abundant energy. This strategy of altering nature, however, has also served to increase the complexity of the modern energy system and introduce new types of risks for humans and the environment.

The state-market coalition has been a main supporter of the abundant energy system. States have mobilized diverse plans and policies to ensure that the abundant and cheap energy system continues to fuel continuous economic growth. These strategies have included deregulation of the energy market, government-funded technological innovation, the creation of electricity industry subsidies, and artificial control over the market price of energy. The decision-making structure of the abundant energy system excludes general consumers and has generated undemocratic socio-economic impacts. For example, the power pricing system that is favorable to big business consumers transferred burdens to general consumers who possess nowhere near the same level of bargaining power. Moreover, the high-energy regime

has caused uneven development and aggravated inequality when it was exported to the developing world.

12.1.2 General Features of Green Growth

The philosophy behind GG has its origins in the international SD discourse as well as in the actualized version of SD; i.e., EM. While SD has remained a declarative and ethical ideal in the international discourse, EM has aimed to provide innovative strategies and action plans to achieve ecologically-sound economic growth. Although economic growth is still considered the highest priority in EM, this SD strategy tried to reconcile material growth with environment production.

Amidst the 2008 economic crisis and impending global environmental apocalypse of climate change, EM, repackaged as GG, emerged as an attractive solution that promised to address both the economic and environmental crises simultaneously. Many countries from both the rich and poor world latched on to the idea of GG, while leading international agencies including the OECD, UN, and World Bank lead the way in promoting GG initiatives. South Korea, a middle power country, was one of the most enthusiastic supporters of GG. The Lee Myung-Bak administration came into power thanks to citizens' high expectations that the leader's career in business would help improve country's declining economic situation. The Lee Administration wholeheartedly adopted GG as the new national development strategy for creating new engines of growth and establishing Korean leadership in the international political arena. The KGGI holistically embraced GG programs that were implemented under strong political will. All government ministries tailored their policy goals around GG and public funds were shifted to KGGI programs. GG revived the Korean tradition of the development state, which had waned since the IMF had

forced the country to open its markets in 1998 as one of the bailout conditions. The Lee administration promoted the KGGI in a strong top-down manner in order to ensure that its effects could be seen during its term in office.

12.1.3 Green Growth: Paradigm Shift or Business as Usual? Policy Shift or Policy Failure?

The dissertation sought to verify whether GG represents a true shift away from business as usual by conducting a paradigm analysis case study of the Korean Green Growth Initiative. This part of the dissertation endeavored to reveal the actual nature of GG by answering the research questions: “Does GG conform to each of the PP’s characteristics?” and “Is GG a policy shift?” The analyses of each chapter converged to the general conclusion that GG remains in the realm of business as usual.

12.1.3.1 Persistence of the Economic Growth Ideology and Belief in Promethean Technology

One of the main goals of the KGGI is to improve the quality of life for citizens. Setting this as a main objective of the national development strategy was perceived by some as a significant turn from the dominant paradigm, which has placed its focus thus far on the pursuit of quantitative material growth. GG may be worthy of being called a paradigm shift if it truly better the wellbeing of citizens and meaningfully addresses the sources of their worries.

The research detected that the crises disturbing the wellbeing of Korean citizens are not simply economic but socio-economic in nature. Citizen anxiety centers on concerns about jobless growth, social polarization, crises of locality, government dysfunction, and in particular, increasing income inequality and weakening job security, even in the face of continuous GDP growth. However, the KGGI programs

that were designed to improve the quality of life of citizen have mainly targeted improving the physical environment, with a focus on green buildings, bike lanes, and eco-parks. Meanwhile, the government emphasizes the value of green households, green consumerism, and green cities. But in spite of all this green rhetoric, programs like these do not tackle the roots of the crises that are causing citizens distress. For this reason, it is difficult to view GG as a new paradigm.

Simply beautifying a neighborhood by including more environmentally-friendly features does little to remove the factors that threaten human happiness; it only helps to create a deceptively present virtual reality that their hands cannot reach, despite it being all around them. In addition, the creation of more green households, green cities, and low-carbon products are only means of circulating money and generating profits in the short-term, if the means by which green products are distributed, policies are designed, and overall perspective of the decision-makers remain unchanged. When these programs were designed, the KGGI did not show any consideration for who would gain, who would lose, or whether the result would be desirable. It is clear that the KGGI's plan for advancing the wellbeing of citizens was to generate economic growth by industrial means such as tourism, construction, and manufacturing. However, piles of green products on the shelf of a huge multinational wholesale shop alone cannot better the life of local people whose sufferings can be traced to more social phenomena.

The KGGI shows an intensified trust in technology, as green technology was selected as most important way for achieving GG. Twenty-seven core technologies were selected by the government as a priority for investment, and the government promised to double total investment in those technologies in five years. The research

revealed that the decision-makers of the KGGI have placed their faith in Promethean technology, in that they believe green technology can solve the modern problems that have resulted from the prevailing scientific civilization. Moreover, the choice of technologies that will decide the future shape of society and way of life is still monopolized by a small group of elites comprised of bureaucrats and professionals in related fields.

All in all, the values and decision-making processes of the KGGI show no significant deviation from the PP. No hint can be detected in any of the KGGI programs that non-material values are treated anywhere near as important as economic growth. In addition, the KGGI programs exhibit no cautiousness concerning the use of Promethean technology. Findings such as these contradict the claim that GG is a paradigm shift.

12.1.3.2 Large Corporations: The Main Agents and Beneficiaries of the KGGI

The dissertation uncovered how the institutionalization of the Korean permit trading system and collapse of the automobile subsidy and levy program showcase the strong influence industries have over government policy. Businesses attempted to entirely dismantle the permit trading system, but its strong symbolism as a representative program of the KGGI saved it from this fate. Even so, the organized resistance of businesses to the Korean permit trading system resulted in a retreat from its initial design, which raises concerns that the system may not function as intended.

On the other hand, the automobile subsidy and levy program that was relatively minor and less well known internationally was vulnerable to attack from industry. Industry stakeholders, i.e., the major Korean carmakers, were very limited and could easily make an alliance. Thanks to the strong resistance from industry, this

program, which planned to levy penalties on high emission cars, was delayed for six years and ultimately became an incentive policy that provided financial aid and tax cuts to eco-friendly cars. In this way, businesses were able to triumph by transforming the program they argued would have been a big burden on them into an incentive policy that was subsidized by general citizens.

These examples illustrate how the KGGI, despite its ambitions to change the existing paradigm, was unable to overcome the coalition that had formed between powerful political and administrative actors and big industries—a coalition that distorted the intention of the programs and altered the distribution of benefits to its own advantage. The case of the KGGI vividly demonstrates that a paradigm shift is impossible if those who gain the most from the existing paradigm, e.g., big businesses in modern capitalism, can exert their power by forming allegiances with governmental actors. Under the supposedly new paradigm of GG, the power of businesses was unaffected. As such, they remained winners even in the new system.

12.1.3.3 Intensified Mastery Over Nature

The PP has accelerated the search for tools to assert human mastery over nature. Ever advancing technology has extended the realm of nature governable by human beings, and the governmentality of nature was further ensured by artificially remaking the environment into human-designed virtual environments. Techniques of artificiality and governmentality were also used to transform various aspects of nature into commodities that could be traded in the market system. But while obtaining mastery over nature through artificiality, governmentality, and commodification, the material progress of the PP has nowhere proven to be sufficient to correct the

deteriorated nature created by modern progress. The same crises continue to threaten to invalidate the PP's tenets.

In order to stop the ominous repercussions that manipulated nature brings forth, GG seeks to reconfigure society-economy-environment relations by making the economy commensurable with the environment. Policy programs for addressing climate change are representative of GG's efforts to continue pursuing economic growth while not harming environmental quality. Cap and trade policies strive to address atmospheric pollution by commodifying the air and granting tradable market rights to pollute. However, realpolitik between government authorities and businesses that occurred during the institutionalization of these cap and trade programs revealed that devices that utilize market principles to achieve environmental protection privilege economic goals over non-economic values such as recovering a balanced environment-society relationship and reforming the inequitable economic power structure.

The 4 Rivers Restoration project was the iconic program of the KGGI. The Korean government pushed this program forward despite the acrid debate over whether the true intention of the project was to improve the environment or boost the construction industry while sacrificing the ecosystems of major rivers or to protect water resources and recover riverside ecosystems. Ultimately, this project introduced an unprecedented amount of artificial structures into the country's rivers and streams to improve governmentality over river ecosystems. In addition, the Korean government made it clear that the main purpose of the project was to stimulate the economy by boosting the construction industry and attracting tourists to the beautified waterfront.

As GG correctly diagnosed, the essential source of environmental crises that threaten the sustainability of human civilization is the over-exploitation of nature for the sake of material gain. For this reason, if there is no fundamental change in the society-economy-nature relationship, solutions to the crises present in the PP are only provisional and have the potential to create unknown problems. However, GG's method of reconciling environmental objectives with economic growth is not indicative of a paradigm-shifting path capable of resolving the anomalies of the PP.

12.1.3.4 Expert's Monopolizing the Governing System

The PP has sought to achieve ultimate efficiency for the betterment of humanity through its governing system monopolized by a few elite experts and bureaucrats. Through this "efficient" governing system, the PP has dramatically transformed humanity's material conditions, life styles, and living environment. People in the rich Northern hemisphere have enjoyed a more affluent lifestyle than the few members of the upper crust did before the Industrial Revolution. Also, institutional democratization has brought constitutionally guaranteed rights even to political minorities.

However, underneath the veneer of greater rights, wealth, and freedoms, this society was characterized by "democratic authoritarianism" (Mumford, 1964). The governing system of the PP concentrated decision-making power in the hands of a small group of experts. People gained material affluence at the expense of their right to decide the rules regulating their lives and the distribution of society's resources. As a consequence, this governance system has served to safeguard the tenets of the PP and shape the unequal power structure of society.

This governing system must undergo a fundamental change if a paradigm shift is to happen. Importantly, it is essential that the main agents charged with making the key decisions for society currently are replaced. Otherwise, the outcomes of the actions taken by decision-makers cannot help but repeat the same values and benefit the same groups of people as the PP has for more than a century.

Unfortunately, GG hardly pays attention to reforming the governing system under the new paradigm it pursues. International development agencies that have been actively engaged in the development and dissemination of GG concepts and policies, including the OECD, UNEP, UNDP, and World Bank Group, have not showed any indication that they considered changing the governing bodies of systems from the current model in which the authority rests with central governments and professional elite groups. Likewise, the governance of the KGGI repeated the existing top-down system, with a few elite bureaucrats who belonged to the Task Force supporting the Presidential Committee on Green Growth dominating the decision-making process. The Korean government tried to show that the KGGI valued democratic governance by embracing a board system as the decision-making body of the KGGI. However, the actual operation of the Committee revealed that general citizens were still excluded from the processes of decision-making and that the participation of other professional groups was limited to legitimizing the decisions and actions of bureaucrats.

12.1.3.5 Adherence to the Abundant and Cheap Energy System

The abundant and cheap energy system of the PP appeared to be a main target of reform under GG. The energy system has provided the material foundation for economic and social development by supplying cheap and abundant energy for mass

production and consumption. For this reason, transforming the energy system of the PP could bring about a fundamental change in society.

Energy policies comprised the main projects of GG. The main goals of these policies centered on replacing fossil fuel-based energy sources with renewable resources and improving energy efficiency. Policy recommendations to achieve these targets were created by international development agencies and think tanks and delivered to member countries. In the Korean context, energy system reform was also the main target of the KGGI. The Korean government took multiple actions to address the structural problems that triggered the country's energy crises, which included ever-increasing energy consumption, high dependency on foreign energy sources, and an anomalous electricity pricing system. However, the amendatory actions undertaken by the KGGI did not result in meaningful reform of the existing system. The main cause of the failure to instigate paradigm and policy change was that the values embedded in the policies surrounding energy system reform did not deviate from the PP's adherence to the cheap and abundant energy belief. For this reason, a focus on developing "green titans" and "scientific nature" dominated the policies aimed at reforming the energy system (Byrne & Toly, 2006). As a result, the newly "reformed" Korean energy system is characterized by massive centralized renewable energy power plants and continuing use of fossil fuels that are obtained through techniques that contribute to the artificiality of nature. Ultimately, the end result of the KGGI's energy reforms has largely been a reproduction of the PP's energy system with only slight changes made to the energy sources and power structure.

12.2 Overall Findings

12.2.1 Failure of GG to Inspire a Paradigm Shift

The prevailing PP is characterized by five core elements: belief that material growth is progress *per se*; confidence in the progressivism of technological change; trust in the efficacy of a coalition between the government and market; human mastery over nature; and embrace of a governance system dominated by experts and bureaucrats. These five elements have shaped modern society and the intensification of these factors has created anomalies to which the PP could not produce effective solutions. The proponents of GG claimed that it was a new paradigm that could solve the crises of the PP. However, the analysis shows that GG failed to trigger a paradigm shift. Instead, GG either perpetuated or intensified the five core elements of the PP. Table 12.1 shows how the five elements of the PP continue to exist in GG.

Table 12.1: Paradigm Shift or Business-as-Usual

The Progress Paradigm	Green Growth (The KGGI)
Material growth is progress <i>per se</i>	Persistence of the economic growth ideology in KGGI plans
Confidence in the progressivism of technological change	Intensified belief in Promethean technology in “cures” by KGGI
Belief in the efficacy of a coalition between government and market	Large corporations: The main agents and beneficiaries of the KGGI
Human mastery over nature	Intensified artificiality, governmentality, and commodification of nature in KGGI policy (especially its pursuit of the 4 Rivers Project)
Embrace of governance by experts and bureaucrats	Professional elites monopolize the governing system of Korea and KGGI supported the monopoly

The development theory of GG still adheres to the ideology of economic growth. The transformation to the GG model was intended to lay the groundwork for sustainable material growth given the omnipresence of anomalies that arose out of the PP's singularly focused pursuit of economic growth. However, many of the underlying values of the PP were not questioned or altered in this new development model. For example, promoting a system of mass production and consumption remained a fixed economic goal of GG, while, the pursuit of non-economic objectives that also affect humanity's quality of life, including social equity, economic and social inclusiveness, social solidarity, a sufficient social safety net, and a clean environment still took a backseat to economic growth and material affluence. In theory, GG claimed that it pursued quality of life rather than solely quantitative growth goals, but in practice the actual GG programs that were designed to improve quality of life were actually devoted to generating increased GDP growth (see chapter 7). In other words, the GG development model carried over many of the same elements from the PP's development model.

Furthermore, the technology-environment-society (TES) relationship that existed under the PP was repeated in GG. Under GG, technological optimism is intensified as society relies heavily on technological progress to solve the environmental degradation that threatens the sustainability of the biosphere. Although the dark side of technological progress bears significant responsibility for the crises that emerged in the PP, the belief that technology can bring forth solutions to the crises dominates the ideology and policies of GG. A shift from the PP is only possible when society pays attention to the risks posed by the artificialized nature that is

created through technology. Nonetheless, GG does not appear to have been concerned with the risks of advanced technology.

The oxymoron “democratic-authoritarianism” (Mumford, 1964), which has characterized the PP’s governing system, is still present in the governance system of GG. As shown in this dissertation’s analysis, the majority of people have been excluded from the governing system of the PP. This lack of participation came as the price of enjoying materially affluent lifestyles, which was made possible through the efficiency ideology of Korea’s expertocracy. The persisting belief in the efficacy of a coalition between government and industry ensured that large corporations, who were the chief deciders and beneficiaries of the PP, were also the main agents and beneficiaries of GG. Although the ever-growing social inequity of the PP stemmed from its unequal resource distribution structure, the architects and discourses of GG have ignored the problems that can be traced to the PP’s top-down governance system and instead replicated this system. Consequently, the winners and losers of society continue to be chosen by the elites, who have been perceived the most capable class to generate GDP growth. Needless to say, GG policies, whose schemes were designed without the participation of general citizens, rarely reflected civil society interests. For example, the Korean electricity price “reform” under the KGGI (chapter 11) provided the corporate sector with cheap energy at the expense of pollution and technology risk (especially with regard to nuclear power development).

In sum, it can be concluded that, in failing to deviate from the five core elements of the PP, GG failed to produce a meaningful change that can be called a paradigm shift in any respect, whether examined from the perspective of development theory, political economic theory, or TES theory.

12.2.2 Failure of GG to Inspire a Policy Shift

One can argue that even if GG did not inspire a successful paradigm shift, it still may have led a shift at the policy level. Thus, it is possible that specific GG policies might have been able to usher in changes that addressed, at least to a degree, the modern anomalies created or intensified by the PP. However, in practice, GG policies were unable to deviate very far from the PP because the basic values and power structure characterizing GG were only one step removed from the existing paradigm.

The GG policies of international agencies including the UNEP, UNDP, and OECD have continued to focus on prescribing typical PP solutions—such as technology development, technology transfer, and the correction of market failures (Fay, 2012; OECD, 2011c; UNEP, 2011). Modern anomalies like environmental degradation are to be addressed indirectly—for example, a common UNDP reform is to grow a country’s economy and use the proceeds to clean up its air, rivers, etc. Likewise, the leading world development banks continue to promote GG policies that are reflective of the PP’s core values.

Similarly, if there was a difference between the development policies created under GG and those created under the PP, it appeared in how the policy recommendations and tools were characterized; i.e., GG policies have promoted the “greening” of familiar technologies and systems. More specifically, the word “green” was added to many existing policies and schemes like a prefix, which resulted in the proliferation of policy recommendations that emphasize “green” technology development, “green” technology transfer, “green” markets, and “green” jobs.

Economic efficiency has remained a guiding principle for selecting the projects to be implemented in countries under the sway of GG. Infrastructure investment is at

the heart of GG policy because it is believed to generate the best economic synergy with actions that also support environmental protection (Fay, 2012).

The KGGI demonstrates that GG also has not led a successful policy shift at the national level. It is difficult to evaluate whether key KGGI projects, such as the 4 Rivers Restoration Project, Korean permit trading scheme, and energy system reform, were able to create incremental changes within a limited scope because the impact period is still short. However, three years after the KGGI 1.0 came to a close following the end of the Lee Myung-Bak administration, the 4 Rivers Restoration project was criticized for damaging the ecosystems of these rivers and their tributaries (KBS TV, January 4, 2016). Moreover, the large debt incurred from the project also caused serious financial distress to a public company that promoted it (Kim, January 21, 2016).

The Korean permit trading system that significantly retreated from its initial plan as the result of a compromise between the government and related industries, received a poor report card at the one-year anniversary of its enforcement. The total trade for one year represented only 0.8% of the total permits allocated, which program insiders have blamed on the permit rates being set too low (Im, December 16, 2015). The history of the EU emissions trading system suggests that vested investment banks and large corporations stand to benefit the most from this type of permit trading scheme, in part because impacts are designed to be small (see chapter 9).

Several indices reveal that energy system reform under GG policy is not likely to bring about a meaningful alteration of the centralized and fossil fuel-dominated energy regime pursued by the PP. The Korean government anticipates that the total capacity of domestic power plants will go beyond 100 GW in 2016. Furthermore,

increased coal generation is leading the expansion of these power plants' capacity, despite energy market trends (Noh, January 25, 2016). In addition, although the abnormally low electricity price has fostered overconsumption and been a key factor in problems such as the 2011 blackout, the KGGI has paid little attention to normalizing the electricity price because it clashes with the government's goal of maintaining a low retail price in order to support the competitiveness of domestic industries. Finally, the percentage of renewable energy to total primary energy consumed has remained unchanged after the KGGI. Renewables accounted for just 1.1% of all Korean energy use in 2005, 1.3% in 2010, 1.4% in 2012, and 1.6% in 2014. This places the country markedly behind Germany (12.6%), the US (6.7%), and Japan (5.3%) in terms of renewable energy use (Song, 2016).

The failure of GG to result in a policy shift indicates that attempting to change policies without changing the fundamental orientation of society, including its core values and power structure, is likely to be unsuccessful. As shown in the case of the KGGI, new policies that sought to achieve GG clashed with other core policies that promoted economic growth and served the existing power structure. In the end, GG policies had little choice but to compromise by imitating the existing policies or risk being replaced with those that reflected the PP's dominant values.

12.2.3 Ecological Modernization: Alternative to a Paradigm Shift?

Countries that have embraced the strategy of Ecological Modernization (EM) have made progress in their energy and environmental policies during recent decades. States that have incorporated EM into their policies, such as Germany, the Netherlands, Japan, and the Scandinavian countries of Denmark, Norway, and Sweden, have been leading the development of renewable energy markets and making

large strides in developing clean energy technology. For instance, the German government has been actively investing in clean energy R&D and utilizing a variety of policy tools to help foster markets for new energy technologies (Jacobsson & Lauber, 2006). Thanks to the active intervention of the government, Germany now has the highest penetration of renewable energy of any country despite having to overcome unfavorable solar radiation and wind conditions that impact its generation. Meanwhile, Germany's national energy intensity, or the ratio of energy consumption to GDP, decreased from 6,126 Btu in 1991 to 4,983 Btu in 2011. Germany's achievement serves as a vivid contrast to Korea, whose already high energy intensity slightly increased from 10,159 Btu to 10,726 Btu during the same period (Data source: <https://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=92&pid=46&aid=2&cid=regions&syid=1990&eyid=2011&unit=BTUPUSDM>).

The achievements of Germany and other countries that have fully embraced EM raises the question of whether a strategy based on EM could be a more realistic means of addressing the anomalies of the PP as opposed to attempting to inspire holistic change through a paradigm shift. The belief that EM could be an alternative pathway for tackling the PP's anomalies would imply that the failures of the KGGI were not due to any embedded problem within the PP but rather represent failures to implement effective GG policies. However, this argument arises from a misunderstanding about the source of the PP's crises, which can be traced to the interactions among the many anomalies that are present across the PP's efficiency-driven approach to advancing material growth that has left its imprint on society, economy, and the environment. In particular, the principle of efficiency, which serves as the PP's dominant means of securing perpetual economic growth, is responsible for

the inequitable distribution of society's benefits and afflictions that disproportionately harm the poorest and most vulnerable people. For this reason, the ameliorative effects of incremental prescriptions, including EM policies, are limited to a specific sphere and unlikely to result in the multi-sector transformations necessary for eliminating the general sources of PP crises. In practice, the stronger versions of EM that have been pursued in developed nations have improved environmental quality to a certain extent but the relevant evidence does not suggest that EM has contributed to solving modern society's other ills, such as deepening social inequality, the increasing loss of human autonomy over social affairs, the threats presented by ever-advancing technology, and the global-scale of harms such as climate change and biodiversity loss, which are products of modern wealth.

It is important to note that different national contexts can restrict the effectiveness of EM policies. In the case of Germany, labor unions and business associations comprised of actors representing the country's renewable energy industries played a large role in pushing the government to take certain policy actions related to EM (Jacobsson & Lauber, 2006). The country's accumulated technical knowledge and experience with advanced administration practices were also important factors in creating a policy environment that have been favorable to EM. In contrast, the power disparity between the traditionally prosperous heavy and chemical industries and infant clean industries in Korea was too wide for the government to shift its support away from these vested interests. More specifically, in the Korean administrative tradition—which grew from the country's long history of using a state-led model of development and is characterized by a patron-client relationship between governmental ministries and their related industries—the strategic incubating of new

policies that threatened to reduce the influence of traditional industries was vulnerable to being stymied due to various power conflicts between businesses. Consequently, the strong application of EM was fundamentally restricted by cultural factors as well as the power traditional industries are able to possess in Korea, which exemplifies how the ability to create EM policies is limited by a variety of circumstances that are often particular to local contexts. For this reason, EM has yet to provide a realistic, widely achievable policy-induced gain. Even where it has succeeded, the spread of such success broadly would not be enough to resolve climate and diversity risks.

12.3 Where does This Leave Inquiry and Policy?

12.3.1 Is the PP Invincible?

The findings of this study may cause some to doubt whether a paradigm shift is ever truly possible, or, even if it is possible in theory, how it could ever be achieved in contemporary societies. Those who believe that a paradigm shift is unlikely to occur anytime in the foreseeable future might view EM as an acceptable middle ground or transitional strategy between the PP and a yet-to-be realized new paradigm.

Indeed, this compromise position may be attractive among policy analysts seeking practical solutions for the anomalies created by the PP. It is important to recognize this position amounts to a belief in the invincibility of the PP. EM proponents may believe that it is impossible to dismantle the intricate PP's socio-economic power relations or challenge its core tenets, which have become deeply rooted in society. They also might think that compromise presents a more reasonable path than a paradigm shift, which may seem to them too utopian.

To these skeptics, I would ask: Is the pursuit of a paradigm shift only an empty, utopian dream? History suggests that it is instead unrealistic to believe in the impossibility of a paradigm shift. Humanity has made small and grand transformations throughout its history, both in the long term and the short term, as well as at the community, national, regional, and international levels. To cite a relevant example, the Republic of Korea, which was formed only recently in 1945, has already been through a series of dynamic changes despite its short history as an ‘Asian tiger.’ Within a timespan of just 40 years, one of the poorest agricultural countries was transformed into one of the most rapidly growing industrial nations. Moreover, the people overthrew the authoritarian political system in 1987. The Korean case demonstrates that if the country had pursued compromise with the status quo instead of holistic change, it is likely that a significantly different society would exist today.

But although history suggests that dramatic paradigm shifts are possible, realism argues that pervasive anomalies and crises make it challenging for society to bring them forth. For this reason, the way towards a paradigm shift has to include a move away from the dominant, centralized, top-down approach.

12.3.2 Polycentricity: An Alternative Governance Model for Creating a Paradigm Shift

This study’s analysis shows that the many modern anomalies facing society cannot be resolved through a new set of policies that retain the prevailing values, elite governance structures, and benefit distribution of the PP. In particular, it was revealed that the GG policies reflected the PP’s core beliefs and served to perpetuate the PP’s crises. Moreover, it was determined that the responsibility for GG’s failure to eliminate the anomalies of the PP can be traced to the agents who developed these new

policies. Chapter 10 illustrated that a small minority of experts and bureaucrats, who have driven the creation of PP policies in a top-down manner, were also the main leaders of GG. Therefore, it is unsurprising that the policies this group created have reflected their own class identity. As Table 1.1 shows, six of the nine KGGI public officers who were interviewed earned their degrees from the US and majored in subjects that support the PP's efficient governing philosophy, including business, economics, public administration, engineering, and international relations. It is likely that the social status and intellectual background of these KGGI officers was a large contributing factor to their adherence to conventional values and methods. As such, the prevailing top down governing system operated by a minority of elite experts was not effective in bringing forth either a paradigmatic or policy transition.

Taking the first step towards a paradigm shift must involve the establishment of a democratic governance system that diversifies the agents tasked with instigating change. As Beck (2006) argues, the risks that contemporaries are facing in what he calls the "second modernity" are resistant to conventional wisdom because they arise from issues that extend beyond traditional socio-economic class to include culture, religion, and environmental philosophy. The failure of the modern expert system to produce effective solutions to these crises is in fact a direct consequence of their becoming increasingly complex and these crises often are accelerated through the standardized and uniform prescriptions developed by experts. Although the struggles of ordinary citizens each take place in their own specific context, it has been the government's way in practice to ignore these contexts and instead forcibly categorize individuals into stereotypes that can fit their standardized programs. Prevailing citizen

cynicism and indifference to governmental actions (Berman, 1997; Williams, 2002) have been among the outcomes of this situation.

The agreement made at the 2015 Paris Climate Change Conference, which encourages the Parties to pursue individual domestic INDCs (Intended Nationally Determined Contributions) after the continued failure to reach a uniform compulsory international target through negotiations, demonstrates the ineffectiveness of a top-down approach to environmental governance. Consequently, the governing system of a new development paradigm would seem to be explored as polycentric and multi-level, if it is to account for the diverse contexts and complexities of the PP's anomalies. Depending upon the nature of the anomaly being addressed, polycentric actions could take place at the level of a city, locality, community, or association of individuals.

Regardless of the level at which it takes place, polycentrism is an approach to governance that is focused on diversifying the agents responsible for leading a paradigm shift. The research community that questioned whether a global agreement will ever be made concerning CO₂ emission targets suggested that a polycentric model could be an alternative for dealing with climate change (Taminiou & Byrne, 2015). In doing so, this community recognized that applying a dynamic and flexible strategy would be more effective for addressing the complicated and uncertain nature of current social-ecological crises. Polycentric governance also shares many of its core elements with polycentric and transitional action as well as the governing networks of municipalities and civil societies (Ostrom, 2012).

This possibility of creating an alternative governance system based on inclusion and the sharing of power, value diversity, and increased autonomy over

social affairs is supported by several successful transitions initiated and promoted from the bottom up. Cities across the world have been competing to introduce creative policies capable of tackling climate change. For example, San Francisco has been enacting innovative policies through its San Francisco Climate Action Plan that was adopted in 2002, and Daegu, the third largest city of Korea, is home to 2.5 million residents and has been leading world solar city initiatives including the Solar City 2050 Project. In addition, the Sustainable Energy Utility (SEU), which was first created in the US state of Delaware, is an example of an innovative, state-level energy efficiency program built around a sound and independent financing scheme. Movements at the community level have likewise been proposing innovative new pathways for pursuing commons-based political economies (Byrne & Taminiu, 2015). Groups of likeminded people that share certain values have been creating ways to protect local businesses and develop their local economies in ways that include sharing the benefits with those who have traditionally been excluded from them. Similar groups are also creating social safety nets for community members by building solidarity across social networks (Cohen, 2010; Daly & Cobb, 1994; Gingrich & Lightman, 2006; Pearce, 1993).

I frequently encounter misguided interpretations of paradigm theory that suggest a paradigm shift must occur at once on a grand scale in a top-down way. However, when we return to Kuhn's theory of how a paradigm can change (1996), it becomes clear that large change is not restricted to a specific course of implementation. For example, Kuhn talks of a pre-paradigm stage in which manifold paradigm candidates exist at once and are competing to become the new "common sense" of that community. In the natural sciences, a paradigm shift can require long

gestation periods before a compelling new theory appears and replaces the dominant theory. In social affairs, it is commonly the case that new values and practices need time to permeate into society. Polycentric approaches to governance are compatible with fostering paradigm shifts of this nature because they encourage communities to reflect upon what social values they would like to pursue from a more localized context. Despite what some skeptics believe, paradigm candidates that can replace the PP are already emerging from the bottom up that accurately understand the nature of current crises and know what direction they want society to take. Because these local agents have a better grasp of what could be effective and ethical solutions to anomalies, their context-sensitive solutions have the potential to be more powerful and capable of bringing meaningful change than centralized, top-down measures such as GG. In this way, ‘humble’ alterations introduced by a diverse group of dispersed actors can gradually pervade into society and inspire more ethical values and equitable power structures.

Most of this research was devoted to describing the characteristics of the PP and its anomalies and analyzing GG’s failure to inspire a paradigm shift. Along the way, I have given a great deal of thought to the implications of this research. Most researchers who provide a critical analysis of policies propose new pathways that should be pursued. However, I will leave this as a future task for myself and other scholars who dream of a more effective, more inclusive, more caring, and more cooperative society. As someone who has only just begun to think about these subjects, what should be done next is too heavy a question for me. Ultimately, I believe that the answers to these sorts of questions must always be sought in the world, not on the expert’s working table. In the meantime, I will continue asking why

certain values and policies are as they are, whether they are actually effective in addressing anomalies, and if there may be other, more ethical alternatives throughout the course of my life journey.

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