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A Discursive Perspective on China's Global Politics of Climate Change, 1992–2013

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Abstract

This dissertation investigates China's recent shift in its climate change policy with a refined discourse approach. Methodologically, by adopting a neo-Gramscian notion of hegemony, a generative definition of discourse and an ontological pluralist position, the study constructs a theoretical framework named "discursive hegemony" that identifies the "social forces" for enabling social change and focuses on the role of discursive mechanisms via which the forces operate and produce effects.

The key empirical finding of this study was that it was a co-evolution of conditions that shaped the outcome as China's climate policy shift. In examining the case, a before-after within-case comparison was designed to analyze the variations in the *material, institutional, and ideational* conditions, with methods including interviews, conventional narrative/text analysis and descriptive statistics. Specifically, changes in energy use, the structure of decision-making body, and the narratives about sustainable development reflected how the above three types of social force processed in China in the first few years of the 21st century, causing the economic development agenda to absorb the climate issue, and turning the policy frame for the latter from mainly a diplomatic matter to a potential opportunity for better-quality growth. With the discursive operation of the "Science-based development", China's energy policy has been a good example of the Chinese understanding of sustainability characterized by economic primacy, ecological viability and social green-engineering. This way of discursive evolution,

however, is a double-edged sword that has pushed forward some fast, top-down mitigation measures on the one hand, but has also created and will likely continue creating social and ecological havoc on the other hand.

The study makes two major contributions. First and on the empirical level, because China is an international actor that was not expected to cooperate on the climate issue according to major IR theories, this study would add one critical case to the studies on global (environmental) governance and the ideational approach in the IR discipline. Second and on the theory-building level, the model of discursive hegemony can be a causally deeper mode of explanation because it traces the process of co-evolution of social forces.

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Chapter One: Introduction

Globalization, Global Governance and the Rise of China

Climate change is one of the most daunting challenges facing the world politics today. The majority of climate scientists today agreed that there is a more than 95-% probability[1] that human influence has been the dominant cause of the observed warming since the mid-20th century. They are more certain of the human influence in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes, as the scientific evidence has grown since 2007 according the Summary for Policymaker Report of the Fifth Assessment Report published in September 2013 by the Intergovernmental Panel on Climate Change (IPCC, 2013, p. 12). These changes in the earth system can cause, and in many places are causing, severe social and political consequences. The rise of ocean-levels are threatening coastal communities; shortened water supplies and heat waves make the world's food supply at considerable risk; and the risk of death or injury on a widespread scale, the probable damage to public health, and the displacement of people and potential mass migrations engendered by the changes of the natural patterns

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[1]. The term used in the report was "extremely likely" which was defined as a probability above 95%. The IPCC has used the following terms to indicate the assessed likelihood of an outcome or a result: virtually certain 99–100% probability, extremely likely: 95–100%, very likely 90–100%, likely 66–100%, about as likely as not 33–66%, more likely than not 50–100%, unlikely 0–33%, very unlikely 0–10%, extremely unlikely 0–5%, exceptionally unlikely 0–1%. (IPCC, 2013, p. 2)

may increase the possibility of violent conflict over land or other resources by exacerbating well-established drivers of these conflicts such as poverty and economic shocks (IPCC, 2014a).

Despite the recognition of the problem, how humanity should do to curb it remains highly controversial. Fragmented policy communities within the United States and all over the world can find numerous cleavages from the method of calculating the costs and benefits in money terms, to the philosophical grounds of responsibility and equity. At the international level, given the perceived urgency for collective action and yet the uncertainties in the assessment of risks, climate change seems to have been turned into an ideological strife among different state or non-state actors particularly at the annual climate negotiations hosted by the United Nations. The global economic recession has added stalemate up to the fragmentation of the global climate politics, demonstrated by the difficult compromise made to extend the Kyoto Protocol in 2012, whereas the successor of the Protocol should have been produced at the Copenhagen conference three years earlier.

Responding to climate change is therefore a pressing issue for global governance empirically and theoretically. Empirically, the traditional approach to managing cross-border issues by establishing international regimes and institutions appears to have encountered great difficulty on an issue without strong political consensus such as climate change. Theoretically, the conventional regime or institutionalist model of global governance that is mapped on a (neo)liberal-democratic conception of world order inescapably sees contradictions emerging from an also conceptually deeply globalized world. As more linkages between different issues are articulated (e.g. climate change and

cross-border conflicts), more type of non-state actors are identified, and more citizen individuals across the globe are more willing to collaborate to combat climate change than national governmental officials, the representation and accountability of national governments in global governance become questionable, shaking the democratic foundation of the socially constructed institutions.

These concerns induced by the problem of climate change would propel IR scholars to seek alternative ways to addressing it at the national and even subnational levels. Along with global governance, another major theme that has occupied IR discussions in the twenty-first century is the rise of the China.[2] For years between 2000 and 2013, the world has seen an astonishing progress economically and militarily: the annual GDP growth rate was 9.8% on average (World Bank, 2015) and its military expenditure has quintupled (SIPRI, 2014). It has overtaken Japan and Russia to become the world's second largest economy and military power since 2010 and 1998 respectively.

In the meantime, the material well-being in China was largely improved. From 1990 to 2013, the GNI per capita based on purchasing power parity increased almost 12 times from 1010 U.S. dollars to 11850 U.S. Dollars, extreme poverty (living under 1.25 dollar/day) was reduced from 60% to 6% (as of 2011) of the population (World Bank, 2015), and the HDI hiked from 0.49 to 0.72 (UNDP, 2014). However, environmental quality in China has deteriorated so much as having been regarded destructive to its economic fruits.

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[2] The subject of China in this research refers to the mainland of the People's Republic of China. The Special Administrative Regions of Hong Kong and Macau are not included.

Moreover, when it comes to the issue of global climate change, China can rarely avoid responsibility and criticism because of its largest greenhouse gases emissions among all nations in the world.

An Empirical Puzzle

This project was initiated by the state behavior of the People's Republic of China in June 2007. The Chinese government issued two policy initiatives— "The National Climate Change Program" and "The Scientific and Technological Actions on Climate Change"—to address the global problem of climate change at the highest level of its statecraft. Six months later, the Chinese participation in the 13th Conference of Parties to the UNFCCC at Bali, Indonesia, was reported as unprecedentedly engaged in the making of the Bali Roadmap. Followed by a series of policy developments on climate change, 2007 has been considered the beginning of China's switch to a pro-climate agenda (Liang, 2010).

How can one understand this policy and attitudinal change of China? What would this change mean to the future of the global climate governance? These were two initial questions that set forth this thesis. A discursive perspective, broadly defined, is used in this research to explore the evolution of China's climate policy that is tied with its development policy. The switch of views on climate issues reflects the transformation of the views on development of the policy elites under the condition of a co-evolving factors. Treating these factors with a sociological lens as informed in the theory "social facts" by Émile Durkheim, the research acquires a broader theoretical scope to possibly account for an empirical phenomenon that has been co-produced by the various factors. A discourse approach is employed to accommodate the complex effects with an approach

aims to identify social relationships involving non-material or non-physical elements, such as the, in a contextualized understanding of reality.

Research Design

Research Questions

This research focuses on the impact from the international community in terms of the ideational power of sustainable development on China's domestic political processes and in turn its state practices. A discourse-analysis approach is employed to investigate the evolution of China's climate diplomacy and its domestic politics regarding the energy policy.

As the climate issue is essentially a development issue for China, special attention should be given to China's development thinking and practices. Therefore, two research questions are posed for my study:

1. **What are the relationships between the views on development and the climate policies of China?**

2. **Under what conditions and with what interpretive mechanisms, do the views on development affect China's climate policies?**

In search for explanations for these two questions, this research has been directed to a reflection on the conception of power in the global environmental governance. Therefore, an additional research question is:

3. **How can power in governance be understood by studying this case about China?**

I propose a constructivist-informed approach to study this problem by exploring the discursive space of China's climate change politics. More specifically, this study aims to investigate China's internal and international reactions to its perceived climate change concerns on the rise with a discourse-analysis approach. The target discourse here refers to the (re)presentation of "sustainable development." Two questions are asked through the analysis of the text data: "What does sustainable development mean in China?" and "In what ways the discourse(s) of sustainable development has involved in the framing and shaping of the Chinese domestic and foreign policy regarding climate change?"

Purpose

"This project examines how the global idea of sustainable development have been understood, used, presented, circulated, and reproduced, in a knowledge/power dynamic relation where concrete effects or political consequences are directed to happen in the timespan between 1992 and 2012. This project intends to achieve three goals. Firstly and at the empirical level, I would like to examine whether and to what extend the discourse of sustainable development is operating in China's climate change politics. Secondly and at the theory-building level, I wish to add one critical case to the studies on the cross-level approach to (environmental) foreign policy and the ideational approach in IR discipline. Thirdly and at the theoretical level, I wish to contribute to furthering the application of the discourse-analysis methodology and its underlying epistemological foundations, which emphasize the constructivist dimension of social facts, mutual constitution between the agent and the structure, and a constitutive type of power.

Theory and Design

As the empirical part of this project is to examine the relationships between the interpretations of development and China's climate change policies, a theoretical model to bridge narratives and practices is needed. While details about the theoretical foundations and the theory-building of this research will be demonstrated in Chapter 3, the core idea is to acknowledge the critical realist position that multiple ontologies exist in contextualized social interactions (Archer, 1995; Khan & Patomäki, 2013; Archer, Bhaskar, Collier, Lawson, & Norrie, 1998; Wendt, 1999), and to systemize the approach of discourse analysis for studying those interactions and the effects they produce based on this epistemological position. For doing this, the concept of "discourse" needs to be expanded and specified in the forms of concept, narrative, and practice.

Based on a Foucaultian understanding, Hajer and Versteeg define discourse as "an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices" (2005, p.175). This meaning-giving quality dictates that discourse must be context-laden. Gee (2010) provides the essence of discourse analysis as a methodology as "the study of language-in-use. Better put, it is the study of language at use in the world, not just to say things, but to do things" (p. ix). My study adopts this understanding of discourse, referring to things beyond "text" and will look into the context of the text. After all, discourse can be also regarded as "the social activity of making meanings with language and other symbolic systems in some particular kind of situation or setting" (Wodak, 2008, p. 6). Therefore, while the core unit of analysis is the "thinking blocs" as

ideas, concepts, and categories, practices in both articulatory and behavioral terms should be also under scrutiny.

Discourses in the forms of concepts, narratives, and practices, are generally theorized as the "non-material" or "ideational" kind of unit of analysis in the conventional material-ideational divide in the philosophy of social sciences (Wendt, 1999, Chapter 2). Drawing on the critical realist epistemological claims, which are heavily informed by the Frankfurt School and Gramscian theorists, I attribute three dimensions of inquiry to the puzzle of China's shift towards an engaged climate effort. They are the material, institutional and ideational dimensions that are mapped on the ontologies of material, institutional and ideational forces.

With a behavioral "shift" as the central puzzle, this is inherently a qualitative, case-study project employing a before-after within-case design (George & Bennett, 2005). For case study is "a strategy of inquiry in which the researcher explores in depth a program, event, activity, process or one or more individuals (Creswell, 2008, p. 13)," the method of process-tracing is employed. Furthermore, this particular case of China on the international climate politics may serve as a "critical case" in the current environmental studies literature—could a country with still relatively low per-capita income levels and restrictions on domestic political participation decide to seriously engage itself with mitigating the climate (Ross, 1999, p. 297)? If so, the conditions under which this could happen and the mechanisms that could facilitate this to happen can be valuable topics of further study.

Why study China using discourse analysis? Studying the narratives presented in China is crucial to understand Chinese society and politics because, firstly, Chinese is an

authoritarian regime. Speeches of the leadership are the final authority. The congruence between the official narratives and actual policy-design is the source of ruling legitimacy. Secondly, in historical traditions Chinese politics is very much defined by "words." So politicians in China, compounded by the effect of the authoritarian institution, are extremely cautious about what they say. The lessons from the Cultural Revolution may also deepen the silencing effect. One may know what the highest political considerations really are by what the top leadership says, but can generally know what they are absolutely NOT. Thirdly, the operation of censorship. This is not only a polity with external restrictions imposed by the suppressive state, but also a society with self-disciplining collective awareness if not behavior. Studying the Chinese politics by looking at narratives and practices from a discourse perspective focuses on identifying the conformity and breaking-off between the two; as well as what is being said and what is not, why it is not, and how the saying or not-saying was done.

Data and Method

Data for this project consist of three categories: text data from Chinese publications including official statements, academic journal articles and newspaper articles; interactional data from formal interviews and causal conversations with Chinese researchers in IR from Chinese Academy of Social Sciences, Peking University, and Shanghai Institutes for International Studies; and an event dataset that I constructed based on the chronological reports by the Earth Negotiations Bulletin[3]. Data on the material

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[3] Earth Negotiations Bulletin (ENB) is an online reporting service owned and run by the International Institute for Sustainable Development (IISD). It has constantly reported all UN international environmental negotiations since 1992.

accounts of the Chinese developmental and environmental situations are obtained from various sources including the World Bank, UNDP, IEA, and the annual Statistical Yearbook published by the Chinese National Bureau of Statistics.

Most of the text and all the interview data were gathered during my research trips to Beijing and Shanghai during September 2012 and January 2013, where I was affiliated as visiting fellow with Tsinghua University and Shanghai Academy of Social Sciences. Due to constraints on budget and social networks, I could not the interview as many professionals as I initially planned, nor could the planned fieldtrips to rather rural areas in Jiangsu Province and Inner Mongolia be carried out for a deeper comparative view on the central/local divergence on energy and environmental policy implementation.

For the text data, I collected major Chinese top-official statements between 1987 and 2012 on development and climate issues, including the Five-Year Plans, President's keynote speeches at the National Party Congress, and white papers on sustainable development, climate change, and energy reform. Besides, 2,056 abstracts of Chinese journal articles were collected based on their subject being "climate change (*qihou bianhua*)" or "global warming (*quanqiu biannuan*)" over the same period. These documents were expected to reveal the "concepts" in the policy elites' ways of thinking about climate change as their prose was more condensed, and the target audience was experts, higher-ranked officials, industry and business leaders, and sometimes foreign governments.

I also collected 1,069 news articles from the Chinese version of the *People's Daily*, the newspaper owned by the Communist Chinese party-state and believed to provide direct information on the policies and viewpoints of the government, from 1989

to 2012. They were selected by the mentions of keywords including "global warming," "climate change," "climate negotiations (*qihou tanpan*)" and "scientific development (*kexue fazhen*)." These data are used primarily to trace the evolution of "narratives" in the policy elites' ways of communicating about climate change. The target audience of this newspaper has been local officials (village or township level), school teachers, and presumably the general public that has completed the compulsory education.

Coding strategies

These text data were coded and processed with the assistance of ATLAS.ti, a qualitative data analysis software developed by a German company named Scientific Software Development. The coding strategies originated from the following questions (Table 1-1), adapted from Gee (2010)'s "toolkit," and these questions served me as a reminder that the pursuit is to grasp the concepts and narrative frames of the concepts over time.

Table 1-1 Operationalization of Research Questions

What does sustainable development mean in China?
- When the term "sustainable development" appears, what are the most common topics for the discussions involved?
- When the term "sustainable development" appears, what are other concepts often referred as related concepts?
- When the term does not appear, is there other compatible idea(s) concerning sustainable development originating from the Chinese discursive context?
In what ways the discourse(s) of sustainable development has involved in the framing and shaping of the Chinese domestic and foreign policy regarding climate change?
- When the term "sustainable development" is referred to as an action or an action-oriented goal, what are the concrete actions suggested in a given context?
- When the term "sustainable development" is an action-directing phrase,

	what are the reasons offered in the given context for its (past or future) success or failure, if any?
-	What kinds of institutions have been and to be established for encountering climate change? At what levels of the administration? How do they evaluate themselves for their performance with or without using the rhetoric of sustainable development?

Main Arguments and Chapter Organization

Two arguments arise from the empirical investigation through the process-tracing of events and texts. One is that the "shift" of Chinese climate policy can be dated back as early as late 2003, instead of 2007 as assumed by some authors who have written on this subject (Heggelund, 2007; Marks, 2010; Ma, 2010). The other is that China has produced a set of development narratives which absorbed the global discourse of "sustainable development," and were mixed with the emphases on "harmony" and "science" as two indigenous mainstream narratives. The "Science-based Development" is the name generalizing this set of narratives. It has penetrated China's climate policy texts and practices, and its proliferation basically synchronized with the degrees of progressiveness of the actual announced policies on climate-related issues since 2003.

Ecological modernization and distributive justice are two major elements in the mainstream international discourses exemplified by a series of authoritative documents. In the Chinese discursive space, these two elements also appear within the rhetoric of "Scientific Development" and "Harmonious Society" when it is used in discussions regarding climate change and sustainable development. Furthermore, the politics and/or political decisions regarding specific climate problem seems to be conditioned by the relative weighing of these two elements in the discursive space—when the ecological

modernization factor is stronger in the heads of Chinese policy participants, the resulted

policies/state actions tend to be more problem-oriented, focusing on management and

institutionalization; when the distributive justice factor is stronger, policies/state actions

tend to be more identity-oriented, focusing on conflicts (in the Marxian sense) and

structural changes. Plausible examples are China's most recent legal enactments on

renewable energy for the former, and its firm stance before 2007 on the "non-promise" to

emissions cuts by the developing countries unless the developed ones accomplish their

reductions responsibilities first, for the latter.

Following the present chapter, which gives an overview of the project, Chapter 2

offers the background of the issue in terms of the international politicization of climate

change and China's early participation, and a review of existing works that have

addressed the same puzzle of China's policy shift in the 2000s. One common flaw they

share is that they assume only one kind of ontology, be it material (e.g. energy thirst) or

non-material (e.g. spread of knowledge within scientific communities), thus excluding

the emergence of alternative hypothesis and the possibility of multi-causality or system

effects.

Chapter 3 demonstrates my building of a theoretical model that synthesizes a

critical realist epistemology and a more flexible discourse-analysis methodology. I rely

on theoretical resources from the writings of Antonio Gramsci and Michel Foucault to

induce a theory and method called "discursive hegemony". I wish to frames China's

behavioral shift as international "socialization" in terms of doing actions that would be

approved within the dominant discourse in the society to which the actor perceives itself

to belong. This formulation of socialization can mean deepening active participation in a

global matter, though it does not necessarily connote better compliance or cooperation. Studies on socialization in IR usually refer it to the internalization of global norms into domestic political or social environments, so they track how particular ideas became accepted and implemented domestically through international organizations (Katzenstein 1996; Finnemore and Sikkink 1998). I generally agree with their methods, but I think the adaptation and reproduction of initially foreign ideas deserve greater attention, as successful domestication or "localization" can produce further interesting outcomes. And a discursive hegemony framework can be helpful in capturing and illustrating this aspect of international-domestic linkages.

Chapter 4 goes into substantive contents of the problem in the material, institutional, and ideational accounts. It examines China's developmental and environmental situations from the perspectives of energy needs, environmental degradation, climate decision-making institutions dimension, and ecologically-informing intellectual traditions. All the analyses aim to understand the actual and epistemological spaces in which China learned about the neoliberal international political economic order and the concept of sustainable development through its opening to the Western world staring from the beginning of 1980s throughout the 1990s. Intergovernmental negotiations on ozone depletion and climate change and professional exchanges between Chinese scientists and the Western oceanographers, climatologists, atmospheric physicists, etc., are the main catalyst of providing material and ideational references for China's configuration of its legal-institutional system on the environment and resources, when most of China's resource and pollution governing institutions was established in the 1980s and 1990s [see Appendix F].

Chapter 6 unpacks the Chinese "Science-based Development" first publicized in 2003, which serves as both an immediate ideational force in Chinese climate politics and illustrates the operation of discursive hegemony. The chapter traces the rhetorical roots in the imported concept of sustainable development and the tactical uses in policy contexts. Chapter 7 is the conclusion summarizing the findings, contributions and limitations of the study. It also discusses how an ideational and reproductive power (eg. Barnett & Duvall (2005)) can find an application in this case of Chinese climate policy embedded in its development discourse mainly evolving from the ecologically-weak concept of sustainable development.

Chapter Two: Background of the Problem and Literature Review

Climate Change in China

Climate warming is happening globally as well as in China. The patterns of warming in China have been consistent with the global trends. In the past 100 years, the mean surface temperature in China has increased by 0.98 °C, with a warming rate of nearly 0.1°C per decade, which is slightly above the global average in the same period. In the 1920s-40s and 1985 onwards, most of the mainland saw an increase in annual mean surface temperature. In the northwestern region, northern Qinghai-Tibetan Plateau and most Inner Mongolia, the increase was especially evident (GoPRC, 2012, pp. 11–12). According to China's Third Assessment Report (CAR-3)[4] published in December 2014, the most recent scientific conclusion of the native researchers is that the country is likely to see an increase in temperatures by 1.3 to 5°C by the year of 2100 (where as the global

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[4] The Chinese "National Assessment Report on Climate Change" is a national-level research project launched in 2002. The initial writing team was undertaken by the Vice Minister of Science and Technology (Li Xueyong), Head of the China Meteorological Administration (Qin Dahe), and Associate Dean of Chinese Science Academy (Chen Yiyu), who were not only responsible for organizing scientists from their respective home organization but also participating in the editing of the report (Ruan & China New Service, 2002). Since the Chinese Panel on Climate Change (CPCC) was established as the official advisory body to the climate change issue, the task of producing this most authoritative scientific report has been given to the CPCC. The CAR and CPCC are modeled on the Assessment Report and the institutional design of the IPCC.

average estimated to be 1 to 3.7°C), raising the sea levels for costal provinces by an average of 50 centimeters (Wang, 2014).

The seasonal pattern of precipitation has altered, while the annual precipitation has roughly remained. Summer precipitation has notably increased since the 1990s, while that of spring and autumn decreased. The changes in precipitation were characterized by large regional differences, and seasonal precipitation also showed clear geographical variations. Under the high GHG emission scenario, however, it is estimated that the annual precipitation nationwide will increase by 2% to 4% by 2040.

China's landmass and large population determines the nature of its vulnerability to climate change. The mainland China contains multiple ecological and climatic subsystems across diverse terrains in its land area as the world's second-largest national territory. Much of its territory is categorized as ecologically-fragile area with poor environmental carrying capacity, where 95% of absolute poverty is recorded (MEP & GoPRC State Council, 2008), while approximately 28 million people are under absolute poverty today.[5]

Experts believe that China will be one of the countries most affected by climate change. Consequences of a warmer world are taking effect in China. In 2012 and 2013, frequency of extreme weather condition rose; the heat waves happening in the southern areas, flash floods which induced landslides and mudslides, and storms/typhoons struck those areas more often and more destructive. Glaciers are likely melting in the

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[5] The absolute poverty line used by Chinese government is 1196 Chinese Yuan per year. With the World Bank's standard (1.25 dollars per day), however, China's absolute poverty headcount can amount to 157 millions.

Himalayas, risking the water supply for not only China but also the neighboring countries like India. Freshwater supply is likely to fall by 5% by the end of this century (Wang 2014). In parts of Yunnan Province, agriculture has been stricken by severe droughts for four consecutive years since 2009 (NDRC, 2013).

The changing climate has prolonged the crop growth period in higher latitudes. In most Northeast region, the growing season is extended by about 10 days than it was in the 1960s. However, climate change had caused a drop of wheat and corn production by 5% between 1982 and 2012, due to more frequent extreme weather events as floods and droughts (GoPRC, 2012, p. 12).

For conditions about water, it has been reported that climate change has worsened the regional distribution of freshwater resources in China. For example, the river runoff and total water resource in the northern China decreased by 12%, while those in the southern increased by about 4% between 1982 and 2012. Since the 1950s, 82% of glaciers have been retreating, most of which are located on the fringes of the Qinghai-Tibetan Plateau. 142 large lakes across the country have been shrinking, losing 12% of their original space. It is estimated that in next three decades, major rivers in China will continue experiencing reduction of runoff in the northern but increase in the southern region. *Hai* River and *Luan* River basins are regarded the most vulnerable areas to climate change on water resources. Hotter and drier climate will likely further degrade wetlands, salinize local freshwater lakes and reservoirs, and reduce the diversity of inhabiting species. Boundaries of mangrove may be shifted north.

Tree lines in China have risen to higher elevations. In the 2010s, the phonological period in spring has been advanced by 2 days than it was in the 1980s. Higher

temperatures and lessened precipitation have intensified the desertification and grassland

degradation in the northern region, causing the forage yield to fall. In addition, sea levels

have also risen. Between 1982 and 2012, the coastal sea level has risen at a mean rate of

2.6 mm per year, higher than the global rate at 1.7 mm per year. Severe land erosion is

happening in some coastal places, such as *Yingkou, Liaoning* province, where the

shoreline retreats nearly 5 meters every year.

One of the immediate threats from the hotter air to public health is heat waves,

which can contribute to greater chances of death out of respiratory or

cardiovascular/cerebrovascular diseases in summer. While statistics about heat wave

damage in China are not yet available, officials have recognized that hotter weather is

able to prolong the malaria transmission season in China, and may also expand the

distribution of schistosome by allowing its host snails to be able to move further north

under warmer weather (GoPRC, 2012, p. 13).

China's Attitude toward Global Climate Change Politics

As mentioned in the previous chapter, as late as 2007, the Chinese government

has fully recognized the urgency of coping climate change in major official documents

and policy directives and been engaged in substantive actions to address it. In fact, the

scientific attempt to approach the climate problem in terms of the rising earth temperature

had a rather prompt start. By 1989, one year after scientific negotiations began, China

had organized a climate change research program encompassing forty projects and

involving about twenty ministries and five hundred experts (Economy, 1994, p. 159). But

the willingness in research activity was not translated into political momentum for neither

domestic nor international actions in the Chinese context until the 2000s.

After the UN-level climate negotiations began, China's attitude on the emerging global climate regime had gone through four noticeable phases: passive-supportive from 1990 to 1994, skeptical and reactionary from 1995 to 2001, actively participative from 2002 onwards and more proactively engaging since 2007.

During the FCCC's negotiations and ratifications (1990-1994), China took a low-profile position in this international scene because of the shortage of knowledge on the subject matter and insufficient negotiation skills, while its prime goal of foreign policy was to "return" to the international society to break the diplomatic isolation since the Tiananmen Square incident. Therefore, China's initial response to the politicized climate issue was passive but rather cooperative, by participating in the talks and ratifying the FCCC almost right after its adoption at Rio.[6] It was the first among the five permanent members of the UN Security Council to sign the treaty, and the 10th earliest state-party to join the Convention (Yan & Xiao, 2010).

Starting from the COP-1 in Berlin in 1995 as parties began engaging in negotiations on specific matters such as funding and technological transfers, China gradually turned skeptical about the impact of climate agreements on its domestic economy, the practicality of funding and technological transfer mechanisms, and even the nature of the regime itself. The flexible mechanisms under Kyoto were once considered tools for "environmental imperialism" by a few political elites and climate policy makers (Yu, 2008, p. 57). Therefore, from 1995 to 2001, China acted tough on stressing the

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[6] Chinese delegation signed the treaty in June 1992 during the Rio Earth Summit, and the People's Congress Standing Committee ratified it in November. Ratification was received by the FCCC Secretariat in January 1993.

"differentiated responsibilities" between the industrialized (the Annex I countries under the FCCC) and the developing countries by forming the G77/China bloc during COPs, insisting on rejecting any voluntary emissions control, not to mention any legally-binding obligations. Its coalition with India, despite their regional military rivalry during the Cold War era, had been a most powerful opposition during and after the Kyoto talks (Wu, 2012, p. 5).

It took China four years to come to agree to the Kyoto regime.[7] It ratified the Protocol in 2002, and the much longer ratification process compared to that for the FCCC can somewhat reflect the intensity of the debates both within China and between China and other nations (Kent, 2007, p. 168). In order for legal compliance, China submitted its initial National Communication to the FCCC in 2004. In the meantime, China issued a series of policies targeting energy efficiency and clean economy. Moreover, in 2007, after promulgating two of the most important comprehensive policy initiatives—The National Climate Change Program and The Scientific and Technological Actions on Climate Change—which place responding to climate change at the center of its economic planning and political discourse, China showed unprecedented proactiveness at the COP-13 in Bali and became a main architect of the Bali Roadmap (Liang, 2010, p. 63; Sung, 2011, p. 20). High leadership's attention continued on to 2009 at the COP-15 in Copenhagen, where President Hu Jintao delivered a speech at the conference and pledged

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[7] Chinese delegation to the Kyoto talks signed the treaty in May 1998, but the domestic approval did not come until August 2002.

China's first quantified commitment on CO_2 emissions reduction,[8] and Premier Wen

Jiabao oversaw the Chinese delegation through the duration of the conference. It was the

first and the most recent time Chinese premier (head of the government) presented on

behalf of the state to the FCCC annual convention.

Table 2-1 Growth and Scale of China's CO_2 Emissions

Year	Total CO_2 Emissions (Million Metric Tons)	CO_2 Emission Per Capita (Metric Tons per person)	CO_2 Emission Per Capita of the World (Metric Tons per person)	China's Share of Global CO_2 Emissions (%)
1992	2375.621	2.017	3.914	11.1
1993	2498.768	2.098	3.884	11.6
1994	2681.799	2.228	3.852	12.4
1995	2722.717	2.238	3.861	12.4
1996	2841.263	2.314	3.893	12.6
1997	3129.778	2.528	3.932	13.6
1998	3197.556	2.563	3.898	13.8
1999	3115.974	2.481	3.900	13.3
2000	3271.809	2.589	3.965	13.5
2001	3353.640	2.639	3.931	13.8
2002	3776.828	2.956	3.991	15.2
2003	4235.697	3.298	4.111	16.3
2004	4744.988	3.675	4.241	17.5
2005	5463.704	4.210	4.365	19.3
2006	5936.036	4.551	4.430	20.4
2007	6326.365	4.827	4.484	21.3
2008	6684.651	5.075	4.510	22.1
2009	7573.380	5.722	4.456	25.0
2010	7997.044	6.012	4.590	25.4
2011	8715.307	6.520	4.694	26.8

Source: USEIA (2015)

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[8] China was committed to a 40-45% cut on its CO_2 emissions per unit of GDP on its 2005 levels by the year of 2020. Despite the controversies over the real contribution of this reduction and its influence on the Copenhagen conference, it was China's first step towards quantified targets and timetables.

Hypotheses and Testing

So why did this shift happen? Why was it 2007 that was marked as the turning point for the shift? This change is the dependent variable of the research of this dissertation. To approach the two questions posed here, a few hypotheses are formulated and tested below to get a preliminary picture.

1. External material attraction

The conventional behaviorist approach in political science postulated that material gains are the fundamental to drive a rational actor's behavior. On the question why China joined the global atmospheric regimes that are currently operational, namely the Montreal Protocol and the Kyoto Protocol, financial implications have been contended. Economy (2010) argued that China ratified the former in 1991 only after a special multilateral fund for financial support and technology transfer was established (Economy, 2010b, p. 188); Kent (2007) argued that China's ratification of Kyoto Protocol in 2002 was because an increase of GEF funding was promised at the COP-6 in 2000 (Kent, 2007, p. 171), and after it confirmed that its eligibility for CDM was assured (Economy, 2010b, p. 191).

Can external material incentive explain the turn in 2007? We limit the specific source of external material incentive to foreign environmental aid as the aforementioned literature did. The derived hypothesis then is: "If foreign environmental aid causes China's shift of policy attitude in 2007, then data should show significant financial inflows of this aid to China before (as condition for prospective cooperative behavior) or after (as rewards for cooperative behavior) 2007."

Table 2-2 Environmental Aid to China from Multilateral Agencies

(Commitment amount in Constant USD 2011)

Year	GEF	UN	World Bank
1991	3,157,404		197,337,765
1992	44,897,731		
1993			384,259,105
1994			
1995	26,183,862		33,431,897
1996			271,376,807
1997	89,622		
1998			
1999	1,131,118	2,731,439	
2000	38,993,994		
2001	7,076,310	401,804	
2002	4,869,385	432,751	
2003	1,637,819	648,002	
2004	32,440,964	597,328	
2005	57,257,140	622,609	1,130,964,320
2006	39,980,039	14,512	
2007	49,580,538	429,199	
2008	23,222,342	137,406	40,132,220
2009	23,267,702	98,559	107,679,964
2010	26,033,979	84,600	159,796,447
2011		150,000	130,000,000
2012	49,044,968	1,526,579	

Source: AidData (2015)

Data below are the committed amount of environmental aids, which include but is not limited to funds for climate-related projects, from the three major multilateral donors: the Global Environmental Facility (GEF), the United Nations (UN) and the World Bank (Table 2-1). As shown in Figure 2-1 and Figure 2-2, it was in 2005 that China received the largest amount of environmental aid inflow. If we consider a time lag of one year in aid commitment process, the supposed behavior-changing timing should be 2004 or 2006, disconfirming the hypothesis. However, if a two-year time lag is applied, then

either 2003 or 2007 could be the behavior-changing year, confirming the hypothesis. The details regarding how these aids were made were not attainable during this research, so the available evidence appears unable to disprove hypothesis that material aids drove China's attitudinal shift in 2007.

Figure 2-1 Environmental Aid to China from GEF and UN
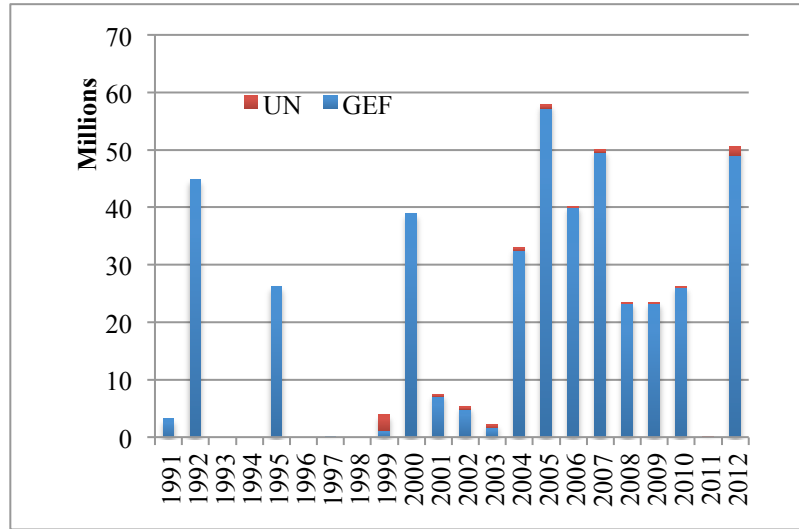
Figure 2-2 Environmental Aid to China
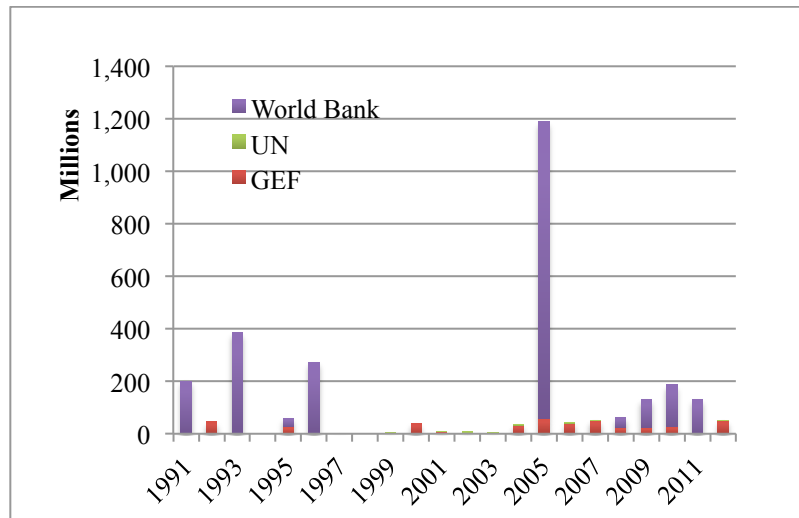
2. Internal material demand

Lack of self-sufficiency is an important reason that drives a state to seek help from the outside. In the climate issue area, energy (in)security can push a state to pursue more cooperation or collaboration with the other actors in the international system. The second hypothesis is "*If domestic energy insecurity causes China's shift of policy attitude, data should show evident decrease of energy self-sufficiency immediately before the observed time.*"

The ratio between energy import and domestic consumption is a common method to measure a state's energy dependence. Figure 2-3 and Figure 2-4 above clearly show the trend that China's energy dependence on foreign supply has grown significantly over the last two decades. There was not a significant rise of dependence before 2007.[9] Moreover, if the hypothesis holds true, the time for China's behavior change would have been between 2004 and 2005 because of a noticeable leap of foreign dependence (on both overall energy and oil) occurred between 2003 and 2004. Another hypothesis-confirming point of time would be 2009/2010 for the sharp increase of energy dependence from 2008 to 2009, but not the year of 2007. Therefore, this hypothesis may be disconfirmed.

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[9] Original data available in Appendix B.

Figure 2-3　Foreign Oil Dependence of China
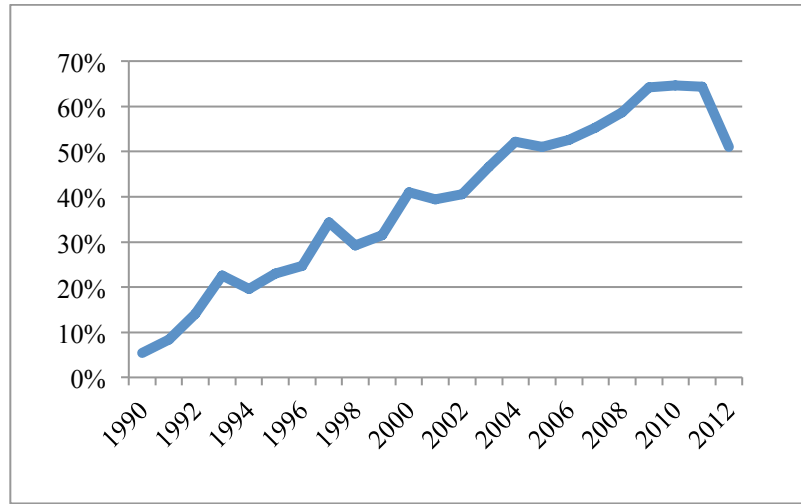
Figure 2-4　Energy Dependence of China
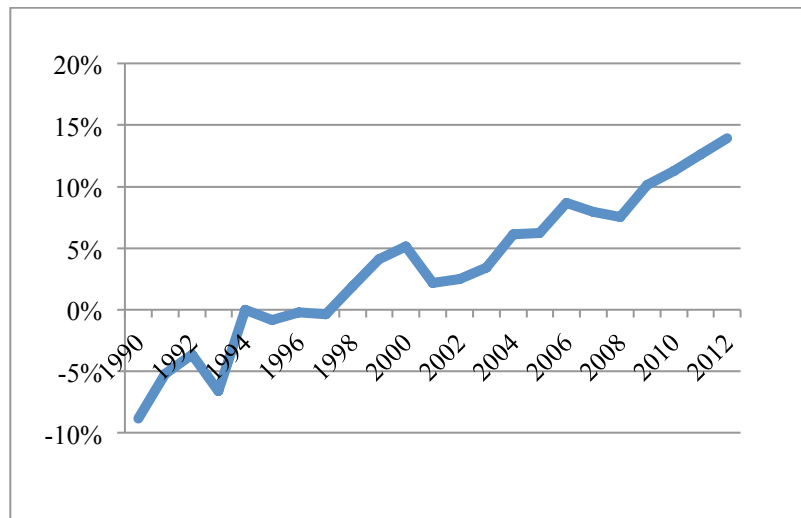
3. External institutional stimuli

A state may change its behavior when receiving "naming or shaming" from the international society. A state may extend its degree of participation in international regimes for enhancing or improving its reputation and image to the other peer states. China had reportedly used the climate change issue to enhance its international image and

advance its foreign policy goals in the Kyoto negotiations. Indeed, the pressure imposed on China during climate negotiations had significantly increased since 2000, partly because it has approved the Kyoto Protocol and partly because its economic and GHG output roared during the first half of the 2000s. The awaiting 2008 Beijing Olympic Games also heightened the international attention to the environmental quality and climate responsibility of China, and perhaps contributed to China's decision on furthering the climate issue in 2007.

How to examine China's pro-climate shift? — A Literature Review

As China's environmental problems have been thought to pose great challenges to the world and stirred global concerns, a plethora of scholarly publications has been produce to discuss, analyze and predict China's environmental policy in general as well as its climate policy. Most of them have noted the attitudinal and behavioral shift of 2007, but relatively few focused on explaining why it happened. Nonetheless, the rich scholarship provides several investigative approaches to studying the research questions of this dissertation.

In the literature of environmental politics, the conceptual relationship between politics, economy and environment forms assumptions that appear to divide two research orientations in the field. The first one is what I call "ecological political economy." This strand of research holds a general epistemological stance that the environment is the center around which human economic and political structures revolve, and it consists of knowledge from disciplines of political ecology, environmental and ecological economics, and ecological anthropology. Whether human is presumed to be a subjective agent independent from the objective nature or an integral part of an *a priori* order of

nature,[10] a politico-economic problem is studied from an ecological perspective. If not as a subsystem under the environment, the economic system is at least seen as a channel between the natural and political systems in that political outcomes have inputs from the environmental factors of which effects are translated or mediated by economic outcomes. For example, ecological economics stresses the "metabolic flows" in the economy (Georgescu-Roegen, 1966, 1971) as the physical foundation for economic activities and then political stability or change.

The second orientation is the "political economy of the environment." Research results with this disposition share an assumption that political and economic conditions determine how the environment is utilized. Compared to "ecological political economy" which emphasizes the physical ecological makeup, "political economy of the environment" puts more stress on the economic and political origins of environmental problems and remedies. Thus, the system of "valuation" (Martinez-Alier, 2012) in these studies usually mirrors the existing business-as-usual practices, such as the monetary value of the services that can be provided by the environment. This is a more common approach seen in discussions of climate politics.

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[10] The mainstream Western (Anglo-Saxon) environmental traditions inherit the philosophical subject-object dualism stemming from the 17th-century Continental Europe, represented by René Descartes, among other Enlightenment thinkers, though the legacy from the romanticist writers in the 18th century indeed influenced the modern eco-centric thought. On the other hand, Taoist and Buddhist philosophies have been considered two of the most ecologically-oriented thought traditions as they assume human are by nature equal to all other species, and that nature works out in its own way that human need not and should not interfere. More details about the oriental/ancient Chinese environmental thinking are discussed in Chapter 5.

Existing Approaches to Climate Change and China

Social sciences literature on global climate change that belongs to the strand of ecological political economy largely focuses on energy, emissions, and economic output. The link between economic output and energy consumption is close, although scholars have been debating about in what ways they are related. The empirical examinations of the environmental Kuznets curve hypothesis have found mixed results regarding the relationships between income growth and environmental pollution (Dinda, 2004; Stern, 2004). It is also inconclusive whether a statistical causal relationship from the increase of energy use to the increase of GDP exists. For example, Kraft and Kraft (1978) argued that only the reverse causality does, while Stern (1993), Stern (2000) and Soytas, Sari, and Ozdemir (2001) found the uni-directional relationship from the use of energy to economic growth in specific countries of the United States and Turkey. More others have found bi-directional causality between the two variables with various country- and time-specific cases, and the majority of the existing works agrees that uni-directional causality runs from electricity consumption to economic growth (Ozturk 2010). That is, energy use and economic growth can reinforce each other, and most of the economic activities that produce outputs accounted directly into GDP—factory manufacturing, market-based exchange of commodities, and financial investments—are immediately dependent on electricity.

For the single case of China, examples that examine the growth-environment or energy-environment nexuses have mixed but compatible results. Soytas and Sari (2006) found no Granger causality between income and energy use in China, while Yuan et al. (2008) showed a bi-directional Granger causality between GDP and energy use in the

long run, and unidirectional Granger causality from GDP to energy use in the short run. Additionally, Song et al. (2008) investigated the long-run cointegration relationship between per capita emissions of three pollutants (waste gas, waste water, and solid wastes) and per capita GDP. The results conditionally confirmed the hypothesis of environmental Kuznets curve in China—the three pollutants presented an inverse U-shape trend over the period between 1985 and 2005. In sum, despite disagreement in method and data, studies on the economy-energy-environment nexus in China have so far reached an agreement that GDP and energy use reinforce each other in the long run.

Other ecological economic works, such as Khan (2010) and Khan and Liu (2008), discussed more broadly the conditions of China's energy security and water security respectively, assessed the future impact due to climate warming, and offered policy recommendations. Lin and Xu (2014) argued that environmental and climate reasons should drive China to change its course of economic growth and transform its overall economic structure, because China will be one of the main victims of climate change should no action be taken to facilitate a cleaner global economy.

The most recent seminal publication on the climate change issue of China is an anthology by twenty-three leading climate researchers and experts in China (Wang et al. 2012). It presents the latest Chinese understanding of climate change relevant to Chinese ecological and policy contexts. Most of the authors were from the major climate research institutions including the National Climate Center of the China Meteorological Administration, Research Center for Sustainable Development (RCSD) and the Institute for Urban and Environmental Studies of the Chinese Academy of Social Sciences

(CASS), and the Institute of Energy, Environment, and Economy at Tsinghua University; some were interviewed for this dissertation research.

Chen (2012) analyzed and evaluated the economic and energy planning of the energy conservation targets in the 11th Five Year Plan (2006-2010). On mitigation, Zhuang et al. (2012) and Hu et al. (2012) reviewed and assessed the current CO_2 emissions reductions measures in China. On adaptation, Pan et al. (2012) constructed a framework for planning, monitoring, and enforcing the climate adaptative activities in China, and provided recommendations on future capacity building in agriculture, public health, coastal protection and water resource sectors. Pan and Chen (2012) discussed the "Carbon Budget Proposal" to constructing the post-Kyoto international climate regime. The proposal was said to employ a method calculating individual historical emissions and future responsibilities. It was presented at the FCCC venue for the first time during the Poznan Conference in 2008. With regard to the research questions of this dissertation, this set of literature in general does not (nor intend to) address policy or political change.

Another bulk of literature belonging to the category of "political economy of the environment" can be further divided into three approaches when it comes to climate change and China.

Structure-based approach

This approach sees climate change as an international political conflict between China and the international society that wishes a greater emissions reduction commitment from China. Thus, studies following this approach tend to assume China as a rational unitary actor, most of the time represented by the central government and leadership only, facing external challenges from the domestic development constraints and

international power struggle forcing it to react. While not dismissing the physical risk of warming, their topics focus more often on the aspect of grand strategy and put climate change as an important part of the international structural change that China should or has been working on to respond.

For example, Lewis (2008, 2009) reported China's recent policy developments in terms of managing the strategic priorities in international climate negotiations. It was argued the security challenges arise due to climate change, so the leadership has been preparing to accommodate the adverse resource and economic implications and the risk of international retaliation. Climate-change policies thus have evolved to become one of the key components of China's global strategy, and the cause is said to be the adjustments in China's grand national strategy to suit the status as a rising power (He, 2010). China therefore wishes to maximize its national interests by balancing those competing priorities between domestic needs and international aspirations in terms of dominating the creation of the post-Kyoto regimes. By extension, Terhalle and Depledge (2013) posited that complex politics of climate change cannot be properly understood without reference to deeper geopolitical trends in the wider international system. So the growing great-power contestation between China and the US is at the core of an order transition that has prevented the institutional redesign in the climate governance structures.

However, while not disapproving the importance of domestic politics and subnational actors, this approach does tend to downplay the complexity of social and even ideational factors, as well as other less visible (and most of the time less viewed) actors such as NGOs, public intellectuals, and expert communities, given its orientation from the rationalist tradition in International Relations. Therefore, when it comes to

change, the abovementioned studies appear to just take the 2007 shift as it is without feeling much need to explain it.

Agent-based approach

Studies with an agent-based approach tend to go into the subnational level of China to investigate the politics of climate change. They often focus on, but are not limited to, the bureaucratic structure and dynamic in the policy-making process. Policy-making in China has become increasingly professionalized and institutionalized since the 1980s reform (Hamrin & Zhao, 1995a, pt. 1). Although top elites have important roles, the dominance is fading and the competition among various bureaucratic agencies and organizations pervades the policy-making of many domestic national issues (Lieberthal & Lampton, 1992). Lampton (1987) found considerable bargaining among domestic actors in China, and that not all bargainers are equal because how much the ability to influence policies greatly relied on how far from the decision point one is situated. Lieberthal and Oksenberg (1988) characterized this "fragmentation" of authority in the Chinese political system despite a formal central-provincial-local hierarchy.

Examining the environmental policy, Lieberthal (1997) demonstrated how the political domain's vertical (*tiao*) and horizontal (*kuai*) lines of authority could impact the local implementation of environmental protection, because the *kuai* authority generally can exert more pressures on the local agencies. Jahiel (1997) argued that the reforms that have promoted economic development have also caused negative effects on the implementation of environmental policy. In addition, those reforms have enabled pollution-control policies to make use of economic incentives.

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As climate change issue is the most closely related to economic and foreign affairs, which are the most professionalized fields in the Chinese policy-making system (Hamrin & Zhao, 1995b, pp. xxxix–xl), much research on China's climate policy has taken this bureaucratic/organization approach. In her pioneering work on the topic, Elizabeth Economy (1994) outlined the roles and functions of various governmental units during the formative stage of the Chinese position in climate change negotiations. She found that the climate change as an issue had limited salability in the government and the opposition between the coalition of the environmental and scientific research bodies focusing on environmental protection, and that of the economic and foreign policy bodies emphasizing principles which did not compel them to assume responsibility for any action to address climate change (Ch. 5). Gørild Heggelund's (2007) extensive account on the domestic and foreign policy aspects of China's climate change policy continued with an organizational analysis of the climate policy-making system from the 1990s to 2006, where the CDM inaugurated and Chinese enthusiasm for it caught the world's attention. The involvement of multiple actors and bureaucratic institutions which represent different organizational interests may lead to fragmentation and ineffectiveness (Marks, 2010). Nevertheless, despite their creation of deeper understanding of actors and intuitions in the governmental policy-making process, most of the existing works in this category falls short of clearly explicating the dynamic between competing actors. This is not surprising given the lack of transparency in the Chinese regime; getting any access to know how particular interests could get adopted into policy outcomes could be risky and unlikely.

Process-based research

Process-based approach emphasizes the interactional dimension between actors or between the agent and structure, and it is inclined to identify the process-variables or enabling mechanisms to explain "how" things happened. Yu (2008) and Kent (2007) focused on the interactions between China and international institutions, and both suggested that the domestic institutionalization under the influence of the international institutions is the main reason for changes in the climate policy of China.

In recent years, attention has been given to the knowledge process in the Chinese foreign policy-making. The official negotiators and scientists at international negotiations often play the role as "knowledge brokers" between information and the domestic decision-makers (Litfin, 1995, p. 254). Also, more civilian research institutions and individuals are gaining access to affecting the actual policy process due to the increasing bureaucratization and professionalization in the official system (Glaser & Saunders, 2002). On the climate issue, experts and the expert community as a whole are capable of affecting the climate policy outcome by bridging their research to power through mechanisms or channels such as government sponsored research, media presence, invited presentation at internal meetings, or serving on advisory committees (Wübbeke, 2013).

With the rise of civil society in China, some have cast their focus on non-governmental organizations (NGOs) and transnational advocacy in the construction of China's climate politics. Yang (2005) presented the rise of Chinese environmental NGOs in interaction with other social institutions in China. Schroeder (2008) examined the interactions between Chinese domestic environmental NGOs and the international environmental coalitions such as the World Wild Fund, The Nature Conservancy,

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Greenpeace, etc. Using a similar method of process-tracing, Stensdal (2014) developed two mechanisms—socioeconomic developments and policy-oriented learning—to explain the changes in China's climate policy in the past 35 years. These works may resemble the agent-based research because they also highlight the role of particular subjects. But what makes them process-based is that they center their analyses on how the subjects acquire and exercise agency, what strategies and conditions are enabling, and most importantly, what mechanisms via which changes have happened.

Discourse Approach

Applying a discourse approach to studying environmental politics in general or just climate change is not uncommon today (Dryzek, 2005; Pettenger, 2007; Hajer, 1995; Litfin, 1995). However, to the best of my knowledge, using discourse as a method for analyzing Chinese climate politics has been a rare practice. Yang and Calhoun (2007) explored China's recent *greenspeak* in the public sphere consisting of environmental NGOs, mass and alternative media, and the Internet. They argued that in China a green public sphere has risen with the participation of nonstate actors such as private citizens and citizen organizations into the production and circulation of environmental narratives, and this discursive activity had created public pressure that halted the damming project of the Nu River in 2004. Eberhardt (2015) challenged Yang and Calhoun's argument with the observations of the "low-carbon" lifestyle discourses in Beijing and found that the Chinese green public sphere appears to be driven by many things, particularly the government's official propagandas, but clear concerns with the environment *per se*. In a different context, Sung, (2011) talked about the Chinese official rhetoric for climate negotiations, as China has used notions of "historical responsibility," "survival

emissions" and "luxury emissions" extensively across time to position itself in the international climate talks and harness its economic interests.

These works share the commonality that they treated discourse in a communicative rather than a generative sense. Discourse was conceptualized and utilized in the way that it is linguistic and symbolic means used for raising awareness (Yang & Calhoun, 2007, p. 214). The meanings conveyed and the articulated connections between different notions were not elaborated. As the discourse approach I propose stresses more on the generative sense, my research will contribute to this part of literature on Chinese climate politics. The construction a theory and analytical framework that I call discursive hegemony is the content of next chapter.

Chapter Three: A Theory of Discursive Hegemony

Discourse Approach to World Politics and the Politicized Environment

The rationalist theoretical approaches dominant in the study of world politics—

neorealism, neoliberal institutionalism, and Marxism[11]— define goals and interests in

terms of objective material conditions. In contrast, reflectivist approaches see policy-

making as a fundamentally intersubjective activity, rather than just as a mechanical

pushing and pulling of nation-states and their agents around externally-determined

interests. The "sociological and interpretative turn" (Guzzini, 2000, p. 147), which

marked the challenge raised by the latter to the former in the discipline of International

Relations (IR), took place in the late 1980s and continued on as the fourth "great

debate,"[12] and has generated a cornucopia of studies identifying new actors and

developing new subjects, methods and research programs. A variety of "social facts"[13] in

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[11] The Marxist IR theories here refer to those applications built on the structuralist understanding of Marxism to especially the world economy, namely the world-systems theory (Wallerstein, 1979; Arrighi, 1994) and dependency theory (Frank, 1967).

[12] The four major debates in the discipline of IR are: realism versus idealism, classicism (traditionalism) versus scientism (behavioralism), neorealism versus neoliberalism, and rationalism (positivism) versus reflectivism (post-positivism) (Kurki & Wight, 2010). The neorealist-neoliberal one is considered an inter-paradigm debate and has been mostly resolved, thus some scholars only recognized the other three as "great" debates (Lapid, 1989; Reus-Smit & Snidal, 2008).

[13] In the formulation by Émile Durkheim (1982), the notion of "social facts" refers to "representations and actions" consisting of "manners of acting, thinking, and feeling external to the individual (p.52)" as "states of the collective consciousness (p. 40)". Examples of social facts

international life, such as identities, interests, norms, scientific experts, and discourse, have become available being articulated in theoretical, empirical and practical horizons of the field (Checkel, 1998).[14]

To a significant extent, despite much divergence and disagreement among themselves, reflectivists in general share the recognition of the methodological inseparability between international and domestic realms. That is, a state-actor at the international level cannot be an atomized, unitary entity to have its preferences and interests constructed independently without the subnational-level entities.[15] After all, the mission of the reflectivist project can be seen as "to erase the artificial boundaries between international and domestic politics so that the dynamic between structure and choice can be illuminated (Adler & Haas, 1992, p. 367)." The abovementioned international social facts are products of the constant mutual construction between agents and between agent and structure;[16] their meanings and ways of operation can be better understood with a view of the world that is social and interactional.

A key problem reflectivists also share, therefore, is the relationship between knowledge and power. Most of them defend the notion that reality is socially constructed based on interpretations. Interpretation, by its nature, is discursive. As Litfin (1995)

can include formal or informal societal institutions such as the division of labor, kinship and marriage, language, religion, government organizations, etc.

[14] Some classic examples are Katzenstein (1996), Finnemore (1996), Klotz (1995), Enloe (1990), Haas (1990), Campbell (1992), and Milliken (1999), among others.

[15] For instance, the norm literature discussed "norm entrepreneurs"(Finnemore & Sikkink, 1998), and some discourse literature, while emphasizing more on the production of meanings, discussed "knowledge brokers" (Litfin, 1994).

[16] However, as Fearon and Wendt (2002) suggested, the rationalist-constructivist debate should halt at the methodological front as the radical/postmodern form of reflectivism that challenges the ontological level of social reality would not bring fruitful discussion.

rightly points out, "If reality is socially constructed, then it must be constructed through the primary medium of social exchange: language (p.252)." Conceptually, what is needed to connect knowledge and power is discourse and the exercise of it—discursive practices that include primarily, but are not limited to, all explicit forms of expression such as speaking, writing, painting, singing, publishing, etc.[17]

Environmental issues are by nature some of the most knowledge-dependent political problems as the understanding of causes, measurements, and possible solutions of environmental degradation almost all the time requires scientific knowledge from multiple academic fields. Early interest in global environmental degradation as a political issue stemmed from the concern with the ecological limits of human societies, in which socio-economic catastrophes could happen in consequence of the breakdown of those limits (Hardin, 1968; Meadows, Meadows, Randers, & Behrens III, 1972; Ehrlich, 1968; Catton, 1980). These works suggested a doomsday picture of the future, warning of problems due to overpopulation and resource depletion over relatively long time horizons. The 1980s saw the merging of environmental degradation with world politics in two ways. One occurred in security studies. Analysts conceptualized environmental degradation as a security threat, with growing sophistication over time and increasing emphasis exclusively on climate change (Gleick, 1993; Homer-Dixon, 1991; Barnett, 2003). The other path was institutionalist studies tackling ozone depletion and global warming as global commons problems (Haas, Keohane, & Levy, 1993; Susskind, 1994;

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[17] In a Foucaultian sense, subjugation in the form of compliance with, silence from, or internalization of certain "truth" also comprises of many discursive practices that are equivalently powerful and worth investigating.

Yamin & Depledge, 2004) within the broader field of international regimes. In recent

years, the further mainstreaming of the environment into IR has appeared as to the

rethinking of conventional IR theories and even the nature of international relations from

an environmental perspective (Eckersley, 2004; Stripple & Bulkeley, 2014; Laferrière &

Stoett, 1999). The discourse approach to global environment arose almost in parallel with

the reflectivist revolution in IR (Hajer, 1993; Litfin, 1994; Dryzek, 2005; Hulme, 2009).

Sociologically informed, those works with analyses of discourses or discursive practices

have shed light on the roles and operation of various agents and scientific knowledge in

our understanding of world politics.

Discourse Method and Climate Change

Having presented the broad picture of the discourse approach and the

development of its application, I shall discuss how the concept of discourse is used and

introduce the other operational definitions in this dissertation. As mentioned in Chapter 1,

discourse is an ensemble of ideational entities that has meaning-giving capacity and

quality. Those ideational entities can be concepts, ideas, categories, and exclusions (i.e.

what the subject is *not*). Dryzek (2005) defines discourse as follows:

> A discourse is a shared way of apprehending the world. Embedded in language, it
> enables those who subscribe to it to interpret bits of information and put them
> together into coherent stories or accounts…Each discourse rests on assumptions,
> judgments, and contentions that provide the basic terms for analysis, debates,
> agreements, and disagreements (p.9).

As such, discourse is not the same as a text or speech itself, but the message the

text or speech tries to convey or gets interpreted (depending on many factors such as the

receiver's understanding). The concept of discourse is usually beyond the concept of text

or narrative, as text or narrative portrays a protagonist act and emphasizes the subjective quality of an activity, while discourse is by definition social and interactional.

Discursive practices, as mentioned above, are activities of expression with or without actual linguistic uses. If there are meanings created, messages sent and received, there exist discursive practices. A *discourse approach* is then a methodological position that stresses frameworks of meaning. These meaning may or may not have structural effects. By contrast, the rationalist and some reflectivist theories stress on agents or agent-derived structures.[18]

Discourse analysis is a mode of research investigating discourses and/or discursive practices with the purpose of identifying what meanings are at work, what effects they produce, and how they come into effect in the given society. To be noted, discourse analysis reserves the space for reflectivity between the social meanings in the society and the researcher's interpretations of them. That is, epistemologically, discourse analysis would not require a separation between the research subject and object, but that does not mean there has to be no distinction as some postmodern thinkers contend. The researcher would normally set up her own rules of method for judging the quality of data and validity of arguments about her observations, and the fellow researchers in the discipline would evaluate the results with the disciplinary standards. Objectivity emanates from long-term intersubjectivities.

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[18] By "agent-derived" structures, I mean the regularized patterns of the operation of some social fact that are a mechanical extension from or just a simple aggregation of the attributes of the consisting agents. For example, the neorealist theory (Waltz, 1979) posits that the international structure is ordered by the distribution of capabilities of the major powers (states) in the system, despite its stress on the structure determining individual agent's behavior (Donnelly, 2000). In my view, neorealist formulation of structure illustrates an agent-derived structure. Studies of epistemic communities are agent-based (see Chapter 2).

Why do environmental studies adopt a discourse approach and how is it useful? Some environment scholars have offered their reasons (Hajer & Versteeg, 2005; Dryzek, 2005).

First of all, nature needs to be rendered linguistically intelligible. Environmental problems tend to be interconnected and complex; they are not simply physical events but inherently *discursive* phenomena because making sense of them requires studies as struggles among contested knowledge claims (Litfin 1995, 254). Without such an interpretative process, it would be hard to imagine problem-solving at all (Dryzek, 1997, p. 9).[19]

Second, adopting a discourse approach reveals agency in the policy-making process, broadly defined. Identifying and investigating discourses enable one to see how a diversity of actors actively trying to influence the definition of the problem, particularly with environmental degradation. Discourse analysis may benefit the understanding of environmental politics and policy in this way. Moreover, various studies have shown how distinct actors exercise power through trying to impose a particular frame or discourse onto a discussion. This supports the point that discourse analysis should not be understood as a type of analysis in which ideas dominate but actors have no important

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[19] However, linguistic activities generate the practical environmental problem-solving process not necessarily via mutual understanding or consensus. Drawing on the case of the "ecological modernization" in the Netherlands (Hajer, 1995), Hajer and Versteeg commented that "the fact that actors debate nature in shared terms does not mean that they understand each other…actors that can be proven not to fully understand each other can still produce meaningful political interventions" (2005, p. 177). Assuming that mutual understanding precedes collective action may conceal discursive complexity, while sometimes the effect of confusion and misunderstanding can be very functional for generating political coalition. One example nicely illustrating of this point is the construction and operation of the discourse of sustainable development, which will be discussed in Ch.4.

role. On the contrary, "they are actively 'positioning' themselves and others drawing on discursive categories" (Hajer & Versteeg, 2005, p.177).

This brings out the third strength of discourse analysis: its capacity to illustrate processes. Political studies want to know answers to "how" questions once "what" questions are addressed. Because discourses help to define common sense and legitimate knowledge, meanings and relationships between the layers and dimensions of a problem are constructed through discursive practices. As such, the analysis of discourses can help illuminate why certain definitions do or do not catch on at a particular place and time and to explain the mechanisms by which a policy does or does not come about.

The case of the contemporary climate change politics can illuminate all the three merits of discourse study above. For instance, the discourse of "survivalism" used to present the urgency of mitigating the warming in terms of the "2°C (3.6°F)" threshold can remind us some facts about the scientific complexity of the periodic average atmospheric temperatures. CO_2 is actually one of the key reasons why Earth is habitable compared to Mars for its heat-trapping capacity (McKay, Toon, & Kasting, 1991).[20] Besides, whether the threshold should be 2°C or another scale had gone through heated debates,[21] not to mention the doubts cast upon the contribution of CO_2 concentration to the earth's surface temperatures based on hypotheses such as the glacial cycles and the "global cooling" effect of volcanic activity. The meteorological system of the Earth and

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[20] Recent proposals on "terraforming" Mars (National Geographic, 2010) illustrate the physical nature of CO_2 and its possible effects in different human and social contexts.

[21] In short, many have agreed 2°C is more of a political and ethnic campaign for mobilizing popular efforts, rather than a genuine consensus in scientific communities. See Jaeger & Jaeger (2010) for an assessment of this perspective.

its interactions with the other systems is extremely complex, and scientific investigations and articulation are the most organized and perhaps most important channel for human to understand it.

Moreover, in the realm of politics, it was the climate sciences that have been use to settle political contentions despite the scientific complexity. One event happened in the United Kingdom in 2007, where a civilian campaign urged the British government to tighten the provisions of its forthcoming Climate Change Bill. The campaigners made newspaper and magazine advertisements, appealing to the authority of science by claiming, "scientists have agreed that the Earth must not exceed an average temperature rise of 2°C, otherwise catastrophic climate change will be inevitable" (Hulme, 2009, p. 103). This example of tracing the survivalist discourse of 2°C also reveals more and more actors of various type— governments, businesses and civilian organizations—have been involved in the construction of the environmental problem and politics of climate change.

Finally, the 2°C example can also inform us one key mechanism in the climate politics as a process: the discursive use of scientific knowledge and even the name of science itself. As Hulme (2009) notes, it is assumed that "…science has the authority to make definitive and universal statements about what is and what is not dangerous for people and societies and, ultimately, for the world." Another symbolic discourse is equity in international negotiations. The G77/China have framed equity in terms of the equal rights to economic development, whereas the Umbrella Group,[22] led by the United States,

[22] G77/China and the Umbrella Group are two party-groupings for the multilateral climate negotiations under the UN. The G77 is a historical coalition among developing countries currently with 133 members. It was founded in 1964 and now functions as one common negotiation position in the UN system. At the UNFCCC, G77 and China have allied since the

have framed the term as equal level of participation in the mitigation efforts when it comes to the allocation of responsibilities for mitigating GHG emissions. Tracing the other discourses such as "risk," "security," or "sustainability" can greatly help to demonstrate and explicate the evolution of state attitudes and positions on climate change.

Construction of Discursive Hegemony

The dissertation adopts a theoretical model called discursive hegemony to further examine the effects of discourse on China's climate policy. The examination and evaluation will be presented in Chapters 4 to 6. In the rest of this chapter, I will explain what a theory of discursive hegemony is and discuss how it is formulated.

The notion of discursive hegemony refers to a condition under which a confluence of material, institutional, and ideational forcings is formed to be an order with a dominant discourse that gives appropriate meanings to the development of each forcing and justifies the action contributing to the persisting of that order. This model is built upon the reading of the conception of knowledge/power by Michel Foucault into the conception of hegemony coined by Antonio Gramsci.

1990s, and the Chair of the G77 in New York often speaks for the G-77 and China as a whole. However, because the G-77 and China is a diverse group with differing interests on climate change issues, individual developing countries also intervenes in debates, as do groups within the G-77, such as the African States, the Small Island Developing States and the group of Least Developed Countries.

The Umbrella Group was formed following the adoption of the Kyoto Protocol, and consists of non-EU developed countries including the Unites States, Japan, Canada, Australia, New Zealand, Norway, the Russian Federation, Kazakhstan, and Ukraine (UNFCCC, 2014).

Gramscian Legacy

A critical theorization of Gramsci's notion of hegemony explores the interface of ideas, institutions and material capabilities as "social forces" (Cox, 1981) in the course of their shaping of the specific contours of the regime. While Gramsci's writing was grounded in a specific historical context of the Italian State and society in the 1920s and 1930s, nor did he give a clear-cut, modern social-scientific type of definition for hegemony as he believed that a concept cannot be considered in abstraction from the particular situations to which it is applied (Cox, 1996, pp. 49-50), a so-called "neo-Gramscian" approach has emerged since the 1980s to address the global political economy (Cox, 1983, 1987; Gill, 1993, 2000; Morton, 2007).

In traditional Marxist-Leninist literature, the concept of hegemony originally meant the political leadership of the proletariat over other exploited classes against the exploiting capitalist class. Gramsci picked up the concept and theorized it to explain not only the political but also the "moral and intellectual" leadership that requires "an ensemble of ideas and values [to] be shared by a number of sectors" in the society as a whole (Laclau & Mouffe, 2001, pp. 66–7).

In the context of class relations, Gramsci discussed hegemony in the sense of a historical moment at which the ruling class gains domination over the subordinate classes through primarily a mechanism of consent, as opposed to simple physical force or coercion. The conception of "historic blocs" refers to the dominant configurations of material capabilities, ideologies and institutions under hegemony; and role of elites acting as "organic intellectuals" forging the historic blocs. The collective consent on this hegemonic order thus can be viewed as a self-enforcing culture. For example, the

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hegemonic culture of capitalism enables the bourgeoisie to maintain control over the

other classes not just through violence, but also through ideology. This culture

propagated its own values and norms, and they become internalized by the subordinate

classes as being universally beneficial, thereby harnessing the leadership of a capitalist

state and the class status-quo in the society. Likewise, achieving a cultural hegemony

should be the grand strategy for the anti-capitalist alliance during its struggle in order to

succeed in a social revolution.

Discourse: the missing link

Although Gramsci's formulations of historic blocs and in turn, hegemony,

recognize the political and social agencies separated from economic conditions, there

seems to be still a theoretical problem as to how the agent-structure relationship can make

social transformation happen—a central concern for practical politics for him. Gramsci,

defying the economic determinism as what he called "mechanical historical

materialism,"[23] indeed emphasized ideology and the roles of intellectuals and education

in the revolutionary effort. However, it appears that ideologies are more instrumental than

generative; he explained ideology as forces that "'organise' human masses, and create the

terrain on which men move, acquire consciousness of their position, struggle, etc."

(Gramsci, 2006, p. 15). In other words, ideology is an effective tool that can be used by

social classes (most of the time, just the elite intellectuals) under hegemony for status-quo

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[23] In criticizing the simple economic determinist view, Gramsci wrote, "Mechanical historical materialism does not allow for the possibility of error, but assumes that every political act is determined, immediately, by the structure, and therefore as a real and permanent (in the sense of achieved) modification of the structure" (Gramsci, 2000, p. 191).

maintaining or counter-hegemonic purposes. It is similar to the "popular beliefs"

mentioned by Marx, as Gramsci wrote:

> It is worth recalling the frequent affirmation made by Marx on the 'solidity of popular beliefs' as a necessary element of a specific situation… The analysis…tends, I think, to reinforce the conception of historical bloc in which precisely *material forces are the content and ideologies are the form* (2006, p.15, emphasis added).

As such, theoretically, if the non-material ideational social force is instrumental

and its exercise purposeful, while the agency of the elite intellectual class is granted, by

what means do the intellectuals play their role in mobilizing the masses? Furthermore, as

the analysis and theory construction of hegemony is class-centered and therefore still

historical materialist (in a more sophisticated historicist way compared to the

deterministic view that he rejected), what would be the theoretical origin of the

counterhegemonic ideology? If ideas and ideologies originate from or along with class

formation, then the agency of the intellectual to use them seems to be called into

question.

This is where I think discourse as a theoretical component can kick in. After all,

the hegemony in Gramsci's depiction is clearly discursive; material, ideas, and

institutions all have structural power on individual and society. What is missing in the

conceptual map is a mechanism to make the structuring process start. And discourse is

the missing piece.

Discourse, power, and Foucaultian insights

The conceptions of discourse and discourse method in this dissertation are

inspired by the work of Michel's Foucault, which centers on the notions of truth and

power/knowledge in terms of their mutual constitution and reinforcement. One cannot

probably define any one of these key concepts without the others as they operate together conceptually. In Foucault's investigation of clinics, prisons, and sexuality, they were seen as working together producing *real* effects in human societies.

Foucault's writing is all about power. More specifically, it is the mechanisms of power (as he called a "microphysics of power") that he had engaged in extracting from social and psychological contexts by studying not only institutions but knowledge. Foucault examined institutions such as hospitals and prisons, and the knowledge and identities operating underneath them (Foucault, 1979). The first feature of the Focaultian power is that it is omnipresent; one is never outside it (1980, p. 141). Power permeates in every aspect of an individual's life as well as human history; domination and resistance exist everywhere (while whether they can be "known" is another matter). This is also the first point from which Foucault and the conventional liberal or Marxist (including Gramsci's) conception of power differ: the conventional and the Gramscian power still hold a modernist belief in the possibility of emancipation from power relations (Litfin, 1994, 20).

The omnipresent and inescapable attributes relate to a second feature of the Foucaultian power that not only it is repressive, but also, more importantly, it is productive based on knowledge and discourse. As he asks:

> If power were never anything but repressive, if it never did anything but say no, do you really think one would be brought to obey it? What makes power hold good is simply the fact that…it traverses and produces things, it induces pleasure, forms knowledge, produces discourse (1980, p.119).

In this sense, the power effects can be meandering, contingent and diffuse, while the power is still totalizing and structuralizing as "webs" or "networks." As such, Foucault's way of analysis is again unlike Gramsci's which treats power as potentially

exercisable and controllable by a subject/class. Although Foucault does not disregard the real, directional exertion of power in the form of class domination, his main concern is "how" this form of power works by knowledge production, identity formation/exclusion, and social acculturation. In other words, it is to study how a cultural hegemony, regardless of the existence of class divisions, could come into being and keep operating.

Discourse is therefore critical in analyzing this power/knowledge dynamic, with cultural hegemony as one of its tangible forms. The intermediate purpose of studying discourse is to extract a "discursive régime," which is about "what governs statements." As Foucault explains it, investigating a discursive régime asks "the way in which [the statements] govern each other so as to constitute a set of propositions which are scientifically acceptable". And the ultimate purpose is to reveal the power relations that "at this level it's…a matter of…*what effects of power circulate among scientific statements, what constitutes, as it were, their internal régime of power, and how and why at certain moments that régime undergoes a global modification*" (1980, p.112; emphasis added). As such, to understand cultural hegemony in a power/knowledge sense is to think about the discursive foundations of those beliefs, norms, and values promoted in the hegemony and those others that are rejected or ignored.

Discursive hegemony as a research method

Simply installing a Foucaultian discursive perspective on the Gramscian hegemony is not the theory of discursive hegemony. As a research method, it is a

synthesis of them with a few meta-theoretical settings.[24] Regarding ontology, which refers to "theory of being," the discursive hegemony theory holds an ontological pluralism shared with the critical realist position. The world is made of concrete objects, ideas and "things" that exist but whose existence may be beyond the available human comprehensibility. Epistemologically, the theory postulates the range of knowledge is within the discursivity of the ontologies. It is the range of human comprehensibility, and the means by which we come to have knowledge of the world is discursive ability. Discursive hegemony includes a hegemony of knowledge, which has defined the naming and ordering of the ideational or material "things" existing in the epistemic world, with the consent from the subjects of knowledge (human). Thus, the methodology of a discursive hegemony theory would be based on a discourse approach. Methods for unearthing data and evidence include those able to reflect the proper discursivity of the object of study. The method selection thus can be very inclusive as long as the researcher appreciates the process of research is a (re)construction of the knowledge in the system for hegemonic or counter-hegemonic purposes.

Relating the discursive hegemony theory which presents a self-generating circulation of power, the methodological approach to studying an actual case of social change would focus on investigating two sets of problematiques. One is to identify the ontological social forces as material, institutional, and ideational kinds; they construct the "historic blocs" or hegemonic structure of the specific historical moment. The other is to

[24] Meta-theoretical specifications are the assumptions used by a theory to see the world. The categories are defined as follows: ontology as the different object domains, epistemology as the criteria for accepting or rejecting particular knowledge claims, and methodology as criteria for choosing particular methods of study (Kurki & Wight, 2010).

identify the mechanisms in discourses that circulate within the specific hegemonic

structure; they construct the "discursive régime" that connects the discursive practices

done towards the recognized ontologies, constructing the knowledge we have about them

thus the world. Specifically, to detect and analyze the deployment of power, three axes

need to be explored: institutional centralization around governmental agencies, the

emergence of new instrumental knowledge, and the diffusion of power effects over

society as a whole (Hajer & Versteeg, 2005, p. 180).[25]

The following three chapters will substantiate discursive hegemony at the global

and national levels. While showing how the existing global climate regime can be a

reification of discursive hegemony, more emphasis will be placed on China and its

seeming transition toward an environment- and climate-aware government.

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[25] These categories are formed partly in the light of Foucault's notion of governmentality. Stripple & Bulkeley (2014a) explains the concept: "As indicated by the semantic linking of the words *governing* and *mentality,* broadly speaking *governmentality* deals with how particular mentalities—ways of thinking and acting—are invested in the process of governing… governmentalities were understood 'in the broad sense of techniques and procedures for directing human behavior'" (p. 9).

Chapter Four: The Global Discursive Hegemony for Climate Change

As one of the most entrenched global commons problems today, the career of climate change problem in the world politics is relatively short but complex. The finding of the warming the earth's atmosphere has risen from a natural scientific exploration to become a center of multilateral negotiations and various subjects of study in politics and economics since the 1990s. The climate agenda today is loaded with many issues, so that the politics dealing with how to respond to the problem has become extremely complex. Climate issue is seen as an energy issue, a technology issue, an environmental issue, an economic issue, an international development issue, an equity issue and an international law issue. This chapter discusses the formation and operation of the discursive hegemony for climate change at the global level by briefing the history of the climate regime with a discourse approach.

Problematizing the Climate

Climate change as it is today is a "man-made" problem in two senses: physical and discursive. From a long-term perspective, meteorological changes in the earth's climate in the past 800,000 years have been constant. Natural forces such as sun's energy, volcanic activities, wobbles in Earth's orbit, feedback of ice sheets, and ocean currents could all cause both long, gradual swings and short, sudden shifts in our climate. Carbon dioxide (CO_2) is one of the heat-trapping gases existing in the earth's atmosphere. Other

gases include methane, nitrous oxide, some chemical substances such as chlorofluorocarbons, and water vapor.[26] Heat-trapping molecules of these gases that exist naturally in the atmosphere cause the greenhouse effect, keeping the Earth's surface temperature 30 degrees Celsius warmer than it otherwise would be. CO_2 is thus essential to preserving life on Earth (Climate Central, 2012, pp. 31–32).

The discursive turn started from the 1970s. In the aftermath of the great public attention to the several hot summers during the decade and the following tremendous scientific progress, the majority of scientists have come down to a general agreement over three things regarding climate change as the rising surface temperatures of the earth: (1) it is the anthropogenic emissions of CO_2 that increased the amount of CO_2 in the atmosphere; (2) increased atmospheric CO_2 caused warming of our planet; and (3) the warmer air and ocean waters melt glaciers and ice caps and the ocean waters expand, causing sea levels to rise and further contribute to accelerating the warming dynamic (Climate Central, 2012, pp. 21–24). Today, it is also believed that human activities have been accelerating the accumulation of heat. Compared to 1880, 2012 was recorded to be 1.53°F (0.85ºC) hotter in terms of the average temperatures of all land and ocean surfaces according to the preponderance of evidence compiled by the IPCC (IPCC, 2013, p. 3). Also, two-thirds of the warming has occurred since 1975, at a rate of roughly 0.15-0.20°C per decade according to an ongoing analysis conducted by NASA (Carlowicz, 2014).

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[26] CO_2 is the more significant component in global warming (despite the quantity of water vapor is 100 times of than its amount in the atmosphere) because of it's atmospheric lifetime, the second largest amount of the identified GHGs, and the associated warming ability.

Evolving from Science to Politics

With the help from scientific knowledge, a new global problem emerged. To date, human response to global warming has been often depicted as a history of building an international regime.[27] Having been conceptualized as a collectivity of material and non-material (ideational) components (Ruggie, 1975; Haggard & Simmons, 1987; Keohane & Nye, 1987), regime is commonly defined as "principles, rules, norms and decision-making rules around which actors' expectations converge (Krasner, 1982, p. 186);" international organization thus constitute the best embodiment of an international regime over an international issue, and is taken as a proper example illuminating the Gramscian thinking on hegemony (Cox, 1983). The process of constructing the climate regime, as will be illustrated below, is a process in which many distinct actors and social forces are involved, constructing knowledge about the commons problem and a consented order (or disorder).

The formation of the climate regime has gone through three stages: agenda formation, negotiation and operationalization (Young, 1998, pp. 4–20). The early development of the international climate change regime took place roughly between 1979 and 1988. This period saw a transition of the concern about the problem from the scientific to the political arena. First identified by Swedish chemist Svante Arrhenius in 1896, the greenhouse effect contributed by anthropogenic emissions of CO_2 was not treated seriously in the scientific community until the 1950s. In 1957, the Mauna Loa

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[27] See Appendix A. for a chronological account of the construction of the global climate change regime.

Observatory in Hawaii was established as part of the research initiatives under the

International Geophysical Year launched by International Council of Scientific Union to

monitor atmospheric CO_2 concentrations. The research on the surface temperatures and

the atmospheric CO_2 concentrations started to boom, and their findings, as well as the

readings from the Mauna Loa Observatory soon convinced most of the scientists that they

were growing at the same time in the post-industrial revolution period.[28]

The scientific community, along with some national government delegates, was

brought to the First World Climate Conference in 1979, organized by the World

Meteorological Organization (WMO). The World Climate Conference established the

World Climate Program, which later organized a series of workshops for international

scientific community, which had generated an emerging consensus that climate change

posed a legitimate threat to the globe by 1985.

Agenda Formation Stage (1988-1990)

The culmination of these scientific endeavors was the World Conference on the

Changing Atmosphere, held in Toronto, Canada, in June 1988. At the Toronto

Conference, participants that included researchers, policy officials, environmentalists,

and business representatives, agreed on the first concrete target and timetable for

controlling GHG emissions, calling upon states to reduce their CO_2 emissions 20% below

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[28] Important scientific findings by the 1980s include the so-called Keeling curve (Keeling, 1960), showing this rise, is one of the few undisputed facts in the climate change controversy, and led to the initial growth of scientific concern in the late 1960s and early 1970s. Improvements in computing power during the 1970s and 1980s allowed scientists to develop much more sophisticated computer models of the atmosphere for global warming predictions. Additionally, later in the mid-1980s, scientists came to recognize other greenhouse gases such as methane and nitrous oxide, making the problem more difficult to tackle than formerly believed (Bodansky, 2001, p. 24).

the 1988 levels by 2005 (WMO, 1988, p. 296). A few months later in November of the same year, the IPCC was co-created by the WMO and the UNEP as a neutral advisory board that aggregates, synthesizes, and circulates scientific knowledge on climate change and evaluates response strategies. Its First Assessment Report was published in 1990, serving the opening of the international political negotiations.

Two concurrent episodes in the latter half of the 1980s boosted the successful rise of political and public attention to global warming. Firstly, the second half of the 1980s was a period of increased concern about global environmental issues generally. Depletion of the stratospheric ozone layer, deforestation, loss of biological diversity, pollution of the oceans, and international trade in hazardous wastes had emerged to the public horizon in the Western industrialized world. The discovery of the ozone hole over the Antarctica and the confirmation of its cause—chlorofluorocarbons (CFCs)—spurred massive concerns beyond scientific or policy circles and raised the prominence of atmospheric issues generally. To a large extent, the early public concern about global warming rode the coattails of the ozone issue. Secondly, the severe heat wave and drought in North America in the summer of 1988 instilled significant popular support to the global warming cause in the United States and Canada. By this time, the narratives and discursive activities regarding global warming were primarily undertaken by the Western non-national-governmental actors.

Negotiation Stage (1991-2005)

Starting from 1991, the United Nations convened formal multilateral negotiations partly as continuation of the Toronto achievements and partly due to effort to

accommodate the developing countries (Bodansky, 2001, pp. 30–31). The negotiations were launched based on a political consensus that a new treaty was needed for the new problem of climate change, and it would follow the model of the Vienna Ozone Convention. As a result, under a UN General Assembly mandate, the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (FCCC) met six times between February 1991 and May 1992. The negotiations took place as part of the preparations for the 1992 UN Conference on Environment and Development (the Earth Summit), held in Rio de Janeiro. The FCCC entered into force in March 1994 and has been ratified by 196 countries as of June 2015.

Immediately after the FCCC became effective, negotiations for next steps beyond began from 1995. The FCCC defined the objective, principles and commitments, and organizational structures of the regimes,[29] but was left with many important substantive issues, specifically targets and timetables, implementation mechanisms and institutions, and financial assistance and technology transfer. The Kyoto Protocol aimed to address them as it was adopted at COP-3 in December 1997 but became a long battle afterwards. Firstly, on targets and timetables, the Protocol has assigned specific targets based on the principle of Common but Differentiated Responsibility (CBDR) for Annex I parties to reduce their GHG emissions, but specific rules and operational details for implementation remained unresolved, while non-Annex I parties industrializing countries were exempted from binding obligations for quantified reductions. Disagreement heated and the United

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[29] Articles 1-4, 8-11 of the United Nations Framework Convention on Climate Change (1992)

States rejected the Protocol in 2001.[30] The second issue during the COP-3 was whether

market-based mechanisms should be established to allow developed states to meet their

targets.[31] In the end, the Protocol created several "flexibility mechanisms," including

emissions trading and joint implementation among industrialized countries, as well as a

"Clean Development Mechanism" (CDM) for emission reduction projects in developing

countries, but provided that these should be "supplemental" to domestic action. Finally,

funding and technology transfer issues were very contentious between the North and

South. Developing countries advocated for a new fund, while developed countries wished

to stay with the existing Global Environment Facility (GEF) created with the FCCC

(Yamin & Depledge, 2004, Chapter 10).[32]

The Protocol finally could enter into force in 2005 without the participation from

the United States,[33] currently with 192 members. It took much longer for the Kyoto

Protocol to be ratified than the Montreal Protocol on Substances that Deplete the Ozone

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[30] The United Stated had signed the treaty in 1998 during the Clinton administration, but it was never submitted to the Senate for ratification because of the passage of the Byrd–Hagel Resolution at the Senate a year before. When asked about his position on the treaty, President G. W. Bush expressed his opposition because "it exempts 80% of the world, including major population centers such as China and India, from compliance, and would cause serious harm to the US economy" (Dessai, 2001, p. 5).

[31] One controversy was whether it is immoral, particularly for the developed countries, to "buy the right to pollute (Sandel, 1997)."

[32] Developing countries, led by India, also sought to include a commitment that developed countries provide "new and additional" financial resources to help developing countries implement the Convention.

[33] Article 25 of the Protocol required at least ratifications of fifty-five countries, and that the participating parties to account for 55% of 1990 emissions for the Protocol to be effective. The United States in 1997 accounted for 36% of 1990 emissions from industrialized country, making it very difficult for the Protocol to become effective.

Layer or the FCCC, reflecting the complexity of the issues involved and the deep schisms among its parties.

Operationalization Stage (2005 - present)

The Kyoto regime was designed primarily to address climate mitigation in terms of reducing the GHG emissions. Since it came into effect, however, its capacity in terms of the extent to which GHG emissions can be reduced has been called into question. More and more tend to see Kyoto as a flawed institution, and its design should be responsible for the setback of global climate governance (Keohane & Victor, 2011; Rosen, 2015; Victor, 2004).

Institutionalist critiques aside, the Kyoto regime has produced practically mixed results. With regard to compliance, those states with binding reduction obligations have a spotty performance record. Emissions of CO_2 in fact increased in Canada and Japan by 25% and 14%, respectively, from 1990 to 2012 (Olivier, Janssens-Maenhout, & Peters, 2012). Though the overall success rates of Europe is slightly better, only 8 of EU-15 countries were reported to have met their individual targets to cut emissions by at least 8% at 1990 levels in 2014 (European Commission, 2014, p. 14).[34] Furthermore, it has been argued that even full participation and compliance with Kyoto would still fail to manage global warming, as the 2007 IPCC report asserted:

> [T]he numerous mitigation measures that have been undertaken by many Parties to the UNFCCC and the entry into force of the Kyoto Protocol in February

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[34] Finland, France, Germany, Greece, Ireland, Portugal, Sweden, and the United Kingdom achieved the goals. The remaining seven—Austria, Belgium, Denmark, Italy, Luxembourg, the Netherlands, and Spain were not on track to meet their requirements, according to 2014 data.

2005… are inadequate for reversing overall GHG emission trends (Metz, Davidson, Bosch, Dave, & Meyer, 2007, p. 97).

On the other hand, the current climate regime has brought about some positive ramifications. CDM appears to be one of the successes. As of April 2015, the CDM Executive Board has certified 2,584 projects (of the more than 7,000 projects registered), which were equivalent to a reduction of 1.5 billion tons of CO_2 emissions. By the end of 2020, the emissions reduction is expected to reach 3 billion tons (UNFCCC, 2015). Moreover, the existing climate processes and institutions under the FCCC-Kyoto regime may serve as catalysts for learning and generate shared understandings about long-term actions to addressing climate change. Indeed, new norms have been created to de-legitimize business-as-usual practices—states and businesses will be pressured if they do not do anything to regulate the GHG emissions in one way or another (Betsill, 2011, pp. 124–5). The idea that every actor has responsibility, as illustrated by the principle of CBDR upheld by the climate regime, has been accepted by all states, regardless of their negotiation positions or domestic considerations. Despite feeling frustrated almost every time since Copenhagen, state parties keep convening year after year for, to the least extent, maintaining the political will for pursing cooperation also because the practical and normative imperatives for combating climate change have formed such sense of necessity.

Sustainable Development as Discursive Hegemony

Problematizing Development[35]

"Development" as a general politico-economic movement and policy directives in the post-WWII era has been much infiltrated by a "modernization problematique", which concerns the discussion over different approaches to understand the process of transition or transformation of a society from being "traditional" to "becoming" modern. Throughout the 19th century, "being modern" had become the normal condition of the people of Western European societies via discourses and practices constructing sets of features that distinguish "modern" from "premodern": science versus religion, reason versus emotion, universalism versus particularism, democracy versus absolute monarchy, industrialized production versus agricultural or nomadic autarky, individualism versus feudal collectivism and so on. This mapping of contrasting notions was carried on after the end of the Second World War, well captured by what was considered the debut of development on the international stage—the inauguration speech of the U.S. President Harry Truman in 1949. He said,

> What we envisage is a program of development based on the concepts of democratic fair dealing…Greater production is the key to prosperity and peace. And the key to greater production is a wider and more vigorous application of

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[35] A brief genealogy of the term "development" in the context of social studies can probably trace its first appearance back to 1942, when Wilfred Benson, a former member of the Secretariat of the International Labor Organization, invented it when writing about the economic basis for peace and referring to the "underdeveloped areas". In a similar context, economists Paul Rosenstein-Rodan and Arthur Lewis continued to speak of "economically backward areas" or the gaps between the poor and the rich countries. Throughout the 1940s, the expression was utilized occasionally in technical publications and did not bear much political relevance until Truman's remarks. The colonizing implication of the term, however, has lurked since its origin (Esteva, 2010, p. 2).

modern scientific and technological knowledge (Harry S. Truman, January 20, 1949, as quoted in Escobar, 1995, p. 3).

Theories on development are primarily underpinned by the idea of progress. In practice, nations deemed in need of development had been prescribed to adopt the model of the Western states to achieve economic growth and political and social democratization. Progress is projected as the process of getting closer to the normal condition that the industrialized West has already occupied; it is the journey to "the end of history (Fukuyama, 1989)".[36]

The narratives of development and underdevelopment have constructed their discursive hegemony. They have defined specific geo-political regions, assigning them with certain political-economic qualities that need to be and eventually are problematized. As Arturo Escobar suggests, development can be seen as an apparatus that "links forms of knowledge about the Third World with the deployment of forms of power and intervention, resulting in the mapping and production of Third World societies (Crush, 1995, p. 207)." In this sense, this hegemony created the identity of the Third World.[37] It was then enabled to articulate the material problems of the underdeveloped

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[36] This (mis)interpretation of Hegel's thought on progress in *Reason in History* shapes the fundamental way of understanding the so-called World History. This "Hegelian Shadow," which I take the liberty of naming, is a stretch from temporality to spatiality with cultural essentialism. It bases its yardstick on the European experience to determine what progress means and what progression is. As a result, those criteria for "modernity" and "traditionality" also serve to tell between progressiveness and backwardness. The process to move from the latter to the former is the essence of development, referring to substantive increase in income and the quality of life. Moreover, despite that these notions got to be challenged due to the increasing awareness of cultural pluralism and the empirical fact of the Asian rapid growth in the 1970s, the Hegelian Shadow remains in the theoretical development of development thinking.

[37] Esteva (2010) remarked about the making of the identity of the Third World by development discourse. He figuratively commented that on the day of Truman's speech, "two billion people

countries that needed to be solved, and generated the problem-solving means as policies and institutions globally.

Early literature treats development from the economic aspect of modernization. From the 1950s to the 70s, development was equated to the enhancement of material well-being in terms of GNP growth, which was expected to eventually trickle down to the people.[38] The principal concern is how to help industrialize/modernize the Third-World countries which had "fallen behind." Thus the ways to accelerate their capital accumulation are considered the best strategies to develop, including the openness of market, reforming political institution, etc. As a counter-hegemonic discourse to this unidirectional and Eurocentric view, dependency school reveals the global structural inequality that has resulted from the history of colonialism, and critiques that the world economic order conspires to mask the continuing imperialist nature of those unequal relationships between rich and poor countries (Hoogvelt, 2001, p. 35).[39]

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became underdeveloped… they ceased being what they were, in all their diversity, and were transmogrified into an inverted mirror of other's reality (p. 2).

[38] Two exemplary works are *The Theory of Economic Growth* by Lewis (1955) and *The Stages of Economic Growth* by Rostow (1960)

[39] However, while the dependency school attempted to resist the intellectual and practical hegemony of neo-liberalism, the dichotomy of core and periphery it created is another version of the Hegelian Shadow that measures one by the criteria originating from the other. Putting blame and responsibility on the Core, in fact, reinforces the ideological construct of the inferiority of the Periphery, at least when *the periphery was made to be* inferior. Therefore, the picture of the structure of domination the dependency school presents is, as Sanyal puts it, "the other side of imperialism." It exhibits "how imperialism shapes the processes in the 'imperialized' economy (2007: 9)." In this sense, the old shadow remains; it is just a different form evolving from the direct application of external sources to the internalization of them. To be noted, this is the trap into which the Third-World nations usually have fallen in their developing process. Many of them—mostly also postcolonial nations—have been engaged in many ways in resisting the Western hegemony by adopting the tools it had used on them, though reluctantly or unintendedly.

In the 1960s-80s, after the increasing recognition that high growth rates did not

bring satisfactory development progress, it was claimed that more means should be

considered than just economic growth. In various international organizations, the

discourse thus changed in such a direction that not materialistic but human oriented goals

slid into the center of attention. The Cocoyoc Declaration, for example, stressed that the

purpose of development "should not be to develop things but to develop man"

(UNEP/UNCTAD, 1975, p. 896).

The criticism on the prominence of economic growth also received support by

increasing ecological concerns. It became widely accepted that growing industries and

consumption are responsible for environmental degradation, as illustrated in, for

example, the Club of Rome's Limits of Growth, a pioneering report published in 1972.

Nevertheless, also in the 1980s the economic agenda remained dominant in the

development narratives and practices due to the expansion of neoliberal agenda, while

recessions in the North and debt crises in the South later led this decade to be frequently

deemed as "the lost decade of development".

The 1990s, on the other hand, saw fresh ideas and concepts emerging in the

discussions of development paradigm (Sen, 1992, 1999). The new foci on human

"capabilities" and "human development" aim to shift targets of development toward

human needs (toward well-being, education, health, empowerment, etc.), with a

theoretical recognition of the complex relationships between human and the physical and

social systems, though economic development would still remains the main tool to

achieve the new set of goals in practice. Yet, more issue and theoretical linkages have

been made to enrich the agenda of development, such as centering human freedom in the development thinking through diversification of human "functionings" and enhancement of capabilities.

As one of the counter-hegemonic movements, the concept of sustainable development (SD) emerged as a countercurrent to the post-WWII model of development for economic growth, and marked the ascent of the environmental aspect of the global life into the mainstream agenda of international relations and IR theory (Lélé, 1991; Meadowcroft, 2000; Redclift, 2005; Carruthers, 2001; Redclift, 1987; Escobar, 1995, pp. 192–4). Since environmental concerns became prominent and legitimatized by the 1972 UN Convention on Human Environment (UNCHE) in Stockholm in the 1970s, the rhetoric of sustainability and later SD has entered the international political and economic thinking (Carruthers, 2001, p. 94). Originally related to ecological economic concept of the thermodynamics of an economic system (Georgescu-Roegen, 1971; Daly, 1985, 1990) and the broader problematiques of the ecological limits (Meadows et al. 1972; Lovelock 1979; Hardin's 1968; Schumacher 1974), sustainability soon was absorbed into development discourse, became widely known as 'sustainable development' pronounced in the Brundtland Report of 1987 as a development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987).

Through a series of events—the 1992 Earth Summit, Agenda 21, UN Millennium Development Goals, and the 2002 Earth Summit in Johannesburg featuring sustainable development—elevating the prominence and popularity of SD, the term has since then

permeated in policy narratives about economic development, environmentalism, poverty, state-building, community-building, and the governance of climate change, internationally and nationally (Bruyninckx, 2006; Cohen, Demeritt, Robinson, & Rothman, 1998; Srivastava, 2011). In the meantime, it is seriously criticized for its conceptual inconsistency and vagueness (Lélé, 1991; Peterson, 1997, Chapter 2; Adams, 2001, pp. 4–7); the Brundtland definition was commented as "a better slogan than it is a basis for theory" (Adams, 2001, p. 5).[40] Yet it is also the vagueness that has led to its success; the void has proved to be somehow politically useful to be highly adaptable to a broad array of ideological grounds (Redclift, 1992; Mebratu, 1998).

When the environmental advocacy began promotion from the Western industrialized nations in the 1970s, some developing countries, including China and India, had been against the international environmental governance in the fear of concern "green imperialism." Today, while tension still lingers between the North and South and the contention of green imperialism persists in trade or environmental talks from time to time, "protecting the environment" has secured its normative legitimacy as a global norm that very few would oppose largely because the idea of SD can contain so many divergent and even contradictory initiatives that each actor can articulate its particular identities and interests through many discursive practices. Northern and Southern countries are joined together under the big tent of SD, as SD soon incorporates other

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[40] Adams's criticism continued that "words about sustainable development…very often prove to have no coherent theoretical core. The literature is strewn with the terms 'sustainability' and 'sustainable development'…but too seldom are any of them given a clear and consistent meaning" (p. 5). Redclift (1987) had the similar opinion that sustainable development "seems assured of a place in the litany of development truisms" (p. 3).

agendas for human rights, global equity, technological and human capital development, etc.

From a perspective of discursive hegemony, the roles of SD as an ideological void and political common ground enable the global environmental issues to epitomize a construction and operation of discursive hegemony. While there are always dissents over means of implementing sustainable development, and sometimes even over definitions of sustainable development; yet there is always the consent from all to adhering to SD as the common goal. Responses to climate change can be a good example.

Climate Change in the Context of Sustainable Development

On the particular issue of climate change and the concept of sustainable development, one would likely ask: "how are initiatives on climate change to be interpreted in terms of perspectives about development?" and "does the support of certain initiatives reflect the implicit adoption of certain prescriptions or values about sustainable development?" (Grist, 2008, p. 785).

Among the rich literature conceptually dissecting and elaborating SD, Adams (2001), Grist (2008) and Hulme (2009, Chapter 8) provide a simple categorization that distinguishes two groups of ideas that address SD (Table 4-1). Each idea informs the current climate practices or debates in one way or another, so I will briefly introduce each idea in the context of the connection between climate change initiatives and SD, and focus more on those that were most powerful within the formal operation of the FCCC and Kyoto regime—market environmentalism and eco-socialism.

Table 4-1 Climate-related Ideas in Sustainable Development Discourse

Mainstream/Reformist group	Radical group
Market environmentalism Ecological modernization Environmental populism	Neo-Malthusianism Eco-socialism Eco-anarchism

Mainstream/Reformist SD

The "reformist" label here refers to a discursive absorption of the initial SD

concept into the prevalent neoliberal globalization project in the 1990s (Carruthers,

2001). As mentioned earlier, the initial SD concept originated from the notions of

"scarcity" and systemic "limits" or "carrying capacity," urging for serious changes of

economic thinking paradigms and practices. However, when the concept started to move

from academic discussion to become mainstreamed into the more visible policy world,

with the Brundtland Report as the first significant politically successful promotion, it has

also begun losing its critical quality by dropping those original emphases.[41] Instead, it has

increasingly allied with the neoliberal ideological positions as ensuring economic growth,

continuous accumulation of capital, and a minimally-regulated market that is maximally

independent from the state. As such, this variant of SD discourse is labeled "reformist"

while the other variant is called "radical" as it preserves some of the conceptual elements

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[41] In the Brundtland Report, limits was elaborated as follows: "The concept of sustainable development does imply limits - *not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources* and by the ability of the biosphere to absorb the effects of human activities. But *technology and social organization can be both managed and improved* to make way for a new era of economic growth (WCED 1987, emphases added)".

that the reformist abandoned. This division is roughly mapped to the differentiation between "weak" and "strong" sustainability.[42]

Within the mainstream group of ideas associated with SD, market environmentalism is one that holds the best applicability of market approach to addressing environment and climate issues. The idea of ecological modernization favors industrial and technological advancement in solving environmental problems (Hajer, 1995). And environmental populism focuses on the individual or societal actors, such as NGOs, in forming individual or community-based actions.

Radical SD

Neo-Malthusianism insists on the system limits and the contradiction between population size and resource availability. Eco-socialism and eco-anarchism share the assessment that environmental degradation has the very origin as the economic, political, and cultural system of capitalism. The main difference between them is that, while eco-anarchists demand an overhaul of the capitalist system and world order to solve the problem fundamentally, eco-socialists tend to work on resistance and try to tame the power of capitalism (Dryzek, 2005, p. 209).

In creation of the FCCC, Southern countries embraced the ideal and have indeed contributed to the articulation of SD into the principles of "common but differentiated responsibility" in recognition of different "historical responsibilities." This reflects one side of the notion of equity, which is highly stressed by the socialist views. The FCCC

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[42] A lot of debate has been made over the definitions of the conceptual variants of sustainability; see Ayres, van den Berrgh, & Gowdy (2001).

treaty states that equity should he a guiding principle in the development of a global response to climate change. The other ways in which equity has been interpreted are, for example, the basis to calculate emission rights. Many developing countries argue that only a per capita allocation of GHG quota for their emissions is equitable, considering their low levels of emissions in both historical and current terms. By the same token, they demand equity to be achieved through reasonable financial and technology transfer for their lack of resources for responding to the negative consequences to which they are often more vulnerable vis-à-vis the industrialized countries.

On the other hand, the development of carbon markets through tradable emissions permits is one of the Kyoto flexible mechanisms and the most economically important initiative. Carbon markets are strongly linked conceptually in ideas of sustainable development to concepts of "market environmentalism." Some of the central tenets of market environmentalism are that "environmental services" can be valued through the markets; markets are a cost-effective way to regulate individual behaviors and achieve policy goals; and that economic growth is mandatory to reduce poverty (Adams, 2001, p. 104; Grist, 2008, p. 787).

As of 2014, the carbon market was worth approximately 30 billion of U.S. Dollars. Thirty-nine national economies and twenty-three sub-national jurisdictions have implemented or are scheduled to implement carbon pricing instruments, including emissions trading schemes and taxes. These entitles are responsible for almost a quarter of the global greenhouse gas emissions, and China is currently the world's second largest carbon market (World Bank, 2014).

Summary

With a theoretical lens of discursive hegemony, this chapter reviewed the construction of the global climate regime from a discourse perspective that underlines the conjunction of social forces and the working of discourse within it.

Sustainable development performs discursive hegemony as it is a structural, consensual, and diffuse kind of power that can affect policy preference, shape interests, and generate policy actions, as I have discussed in the climate change regime. In addition, the definitional debates regarding what SD really means and to where it should lead do not shed the hegemonic status of the sustainable development discourse; the contention rather strengthens its power. Hegemony in a discursive sense is a process in which domination is socially constructed through internalization of ideas and co-option of rhetoric.

Chapter Five: Social Forces in Chinese Discursive Hegemony

Introduction

This chapter examines the social forces of hegemony outlined in Chapter 3. Material conditions, institutions and ideas together formed the historic bloc or "background abilities" (Schmidt, 2008, p. 305) in the policy process of the evolution of China's climate change policy. The chapter does so mainly by contrasting the country's economic development before and after the watershed year of 2003. In this year, a few events happened and set the direction for subsequent decisions affecting the overall policy towards climate change.

In the context of climate change discussion, economic growth, energy needs and environmental quality are the three most relevant components of material conditions. To examine the institutional force, the policy-coordination paradigm of Chinese policy-making is chosen to illuminate the debate between fragmented authoritarianism and the consensus-coordinating model. For the ideational force, several ancient philosophical and modern political ideas are discussed in their relationship with environmentalism. This discussion attempts to explore the influence those ideas may have with both the environmental destruction between the 1950s and 1990s and the pursuit for a changing course in the 2000s.

Social Forces for China's Development Thinking

Material Force I: Economic Growth

From a long-run perspective, the Chinese economy has experienced many dramatic changes in the past 200 years, one of which is its economic growth in terms of quantity and speed. In the early nineteenth century, China possessed 33% of the global gross domestic product and was the greatest economic power. However, natural disasters, poor governance, and consecutive warfare from 1840s to 1950 had brought down its share of the global GDP to 5%, reducing the nation to one of the poorest in the world (Table 5-1). The decline continued after the Communist regime came into power. At the closing of the Great Leap Forward campaign in 1962, China's share of the global GDP dipped to 4%, the bottom in its entire economic history, according to Angus Maddison's estimation (Maddison, 2008).

The hundred-year decline drew to a close with the official conclusion of the Cultural Revolution. The "Open and Reform" began to drive up the Chinese economy from 1978. Since then, the world has been presented an unprecedented growth in industrialization and rapid reduction of poverty in China. According to the World Bank data, China has surpassed the United States to lead the world's industrial production since 2011 (World Bank, 2015). In late 2014, the International Monetary Fund confirmed that China has overtaken the US to become the largest economy in the world in terms of purchasing-power adjusted GDP (Bird, 2014). Disagreement exists from the validity of the PPP method in evaluating a country's real economic performance to the meaning of

such event to the global economy. But to China, few would disagree that it has dramatically risen up from the bottom to the top in the world economic system.

Some other macro-level figures indicate that China's growth was not only fast but stable. Between 1990 and 2013, China's average annual growth rate was 10.16%. The average inflation rate was 4.6% and unemployment rate 4.4%, both lower than those of several other emerging economies over the same period. Industrializing economies generally have higher consumer price inflation rates. For example, between 1990 and 2013, the average inflation rates in India and Indonesia were 6.9 and 10%, respectively, while Russia and Brazil had 82% and 355% due to their domestic political and economic unrest in the early 1990s (Table 5-2). Even in the stabilized 2000s and 2010s, in which their national and international environments have been more favorable for them, the average annual inflations amount to 6.9, 7.5, 11.6, and 6.6% age for India, Indonesia, Russia, and Brazil, respectively (World Bank, 2015).

Micro level data also confirm China's progress in the traditional sense of development. Its GNI (gross national income) per capita grew almost 7 times within the same 23-year-timespan. Life expectancy at birth increased by 5.9 years, greater than the global average of 5.3 years, and adult literacy rate increased from 78% in 1990 to 95% in 2010. Both of these were just two indicators of the remarkable achievements of improved basic healthcare and education systems.

Table 5-1   Share of the World GDP, 1700-2030

Shares of World GDP, 1700-2030 (per cent)						
	1700	1820	1952	1978	2003	2030 (forecast)
China	22.3	32.9	5.2	4.9	15.1	23.1
Japan	4.1	3	3.4	7.6	6.6	3.6
W. Europe	21.9	23	25.9	24.2	19.2	13
United States	0.1	1.8	27.5	21.6	20.6	17.3
USSR/Russia	4.4	5.4	9.2	9	3.8	3.4
India	24.4	16	4	3.3	5.5	10.4

Source: Adapted from Maddison (2007)

Table 5-2   Comparative Macroeconomic Conditions, 1990-2013

	Average (per cent)		
	GDP growth*	Inflation Rate	Unemployment Rate
China	10.70	4.58	4.40
India	6.53	8.00	3.99
Russia	0.71	82.00	8.30
Brazil	2.96	355.00	7.80
Indonesia	4.89	7.47	7.13

* calculated based on PPP (constant 2011 international $)
Source: calculated from World Bank (2015)

Material Force II: Energy Needs

General trends

What follows economic growth is the growth of energy use (Chapter 2). China's current energy situations have two features: an expanded size of energy demand in the 2000s, and a constant, heavily coal-reliant structure of energy consumption.

The geographical distribution of China's natural energy resource endowment is uneven. Its coal resources are vast, even by international standards, but they are concentrated in the north of the country. Its significant but declining oil reserves lie in the northeastern and northwestern regions, while the natural gas is found mainly in the

northern, northwestern and southwestern areas with more limited reserves. Hydro-electricity is concentrated in the center and southwest of the country. Not only are these primary energy resources probably insufficient to meet the long-term demand, but they lie far from the main economic centers with heavy energy demands in the south and east of the country. This natural condition has significant impact on China's energy supply as the energy storage and transport across extremely long distance has posed tremendous challenges to China's energy development, increasing risks to its energy security and self-reliance.

China is currently the largest commercial energy user in the world. It has been the world's largest primary energy producer since 2007 and consumer since 2010, taking up almost 1/5 of the amount of energy used by the entire world. It is now the 2nd largest oil importing country, a fastest natural gas importer and renewable energy builder, and the largest greenhouse gases emitter from energy since 2007. It is also estimated that by 2030, the total amount of Chinese demand will grow by 60% based on the level of 2014, and 76% by 2040 (USEIA, 2013).

China's energy demand had grown enormously (Table 5-4). From 1992 to 2012, China's total energy consumption tripled. The Chinese energy demand has also grown much faster than other comparable developing economies. Between 2003 and 2012, the average growth rates of energy consumption of Brazil, India, and China are 3.8%, 5.8%, and 8% respectively (BP, 2013). Additionally, between 2000 and 2005, during which China implemented its Tenth Five-Year Plan mainly focusing on heavy industrialization, 45% of the world's total increase in primary energy consumption was attributed to China.

Since 1994, the total energy supply from the domestic energy sector had been closely followed by the increasing demand of the expanding economy. The total consumption surpassed the total production for the first time in 1998, marking the end of energy self-reliance (Table 5-5).

As Figure 5-1 shows, the two series (production and consumption) nearly overlapped until the early 2000s. After the supply fell behind in 1998, production was increased to meet the demand from the next year. But very soon the gap got widen again in 2001 and only had gone greater ever since.

The literature also has pointed out the China's energy consumption has grown faster in the 2000s compared to the period between 1980 and 2000, where its GDP quadrupled while its energy consumption "merely" doubled (Heggelund, 2007, p. 161). Between 2003 and 2005, economic growth has been more than 8% per annum. At the same time, energy demand grew by about 15% annually while oil imports grew at 30% per year (Khan 2010, p.1). As such, the early 2000s, precisely between 2003 and 2004, where the foreign energy dependence jumped from 3% to 6% (Appendix B), was a critical timing to contrive new plans as the economy could confront very difficult constraints from the supply side.

The demand side could only make the situation harder, as energy consumption grew faster in the post-2000 period as opposed to the previous decade; the average annual growth rate between 1992 and 2001 was 3.62%, whereas that between 2002 and 2013 was 8.1%; the average annual growth rate over the entire timespan of this research was

6.05%. The energy use in the latter period has expanded significantly (Table 5-4).

Finally, the per capita consumption of energy doubled between 2003 and 2008.

Figure 5-1 Trends of China's Total Energy
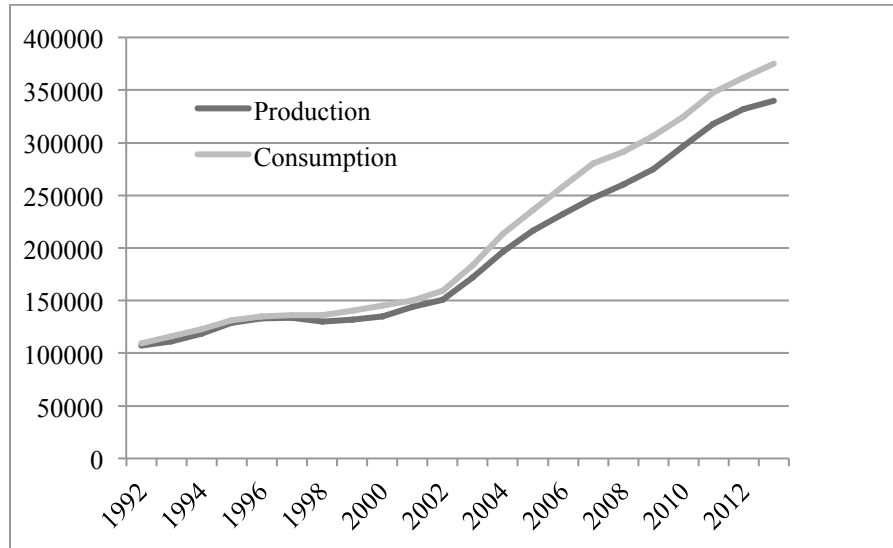
Regarding the sourcing of energy, fossil fuels currently takes up around 90% in

China's primary energy consumption. This ration had been as high as 96% in the

beginning of the market reform (Table 5-4).

Coal

Coal is the most important source to provide for China's energy needs. In 1989,

China became the first country in the world to produce more than one billion tons of coal

during a single year. By the early 1990's, coal provided over 76% of the total energy

needs of China; it accounted for 75% of industrial fuel and power, 65% of the raw

material for the chemical industries, and 85% of the fuel for urban residents[43]. While high

demand and environmental concerns ended its self-reliance on coal in 2009, China still

leads the world in both the production and the consumption of coal. In 2013, 78% of the

energy produced in China came out of coal, and 69% of the Chinese consumption of

energy was based on coal (National Bureau of Statistics, 2014). The long-term records

show that coal has taken up approximately 70% of the energy consumption since the

1980s.

In 2007, when China became the world's largest CO_2 emitter, its coal

consumption reached 2.62 billion tons— more than the United States, Japan, and the

United Kingdom combined. In 2000, China anticipated doubling its coal consumption by

2020; it surpassed this mark by 2007. Consumption in China is huge partly because it is

inefficient. As one Chinese official told Der Spiegel in early 2006, the amount of

resources generally used by Chinese manufacturing industry was seven times of the

amount of resources used by Japan, almost six times of the that of the U.S., and even

nearly three times of that for India—that official deemed this "a particular source of

embarrassment" (Economy, 2010a, p. 309).

China's coal sector does not appear to have the juncture in the early 2000s, for the

consumption and production of coal have grown in tandem consistently.

Although many studies have forecasted that the peak of Chinese demand for coal

is approaching, their opinions diverge with regard to when and at what level this peak

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[43] The rest of China's fuel needs were met by oil (17%), hydropower (4.8%) and natural gas
(2%).

will be (Andrews-Speed, Herberg, Li, & Shobert, 2014, pp. 35–38). In November 2014 after a joint pledge between President Xi Jingping and President Obama on CO_2 emissions reduction, the Chinese government announced that it will cap its coal burning at 4.2 billion tons and will have coal be no more than 62% of its primary energy mix by 2020 (Xinhua, 2014).

Being aware of the hazardous consequences of burning coal, China seems to have tried incrementally to lower its use of coal since 2010 in terms of reducing the ratio of coal in the energy consumption mix (Table 5-4) though the total amount of coal used is still increasing. The existing energy mix is unlikely to change in a short run. In the meantime, the coal-fired power capacity is even expanding. As of November 2012, there are 363 coal-fired plants newly proposed to be built in China, according to a working report published by the World Resource Institute (Yang & Cui, 2012). The total planned capacity is estimated to be 557,938 megawatt-hours, amounting to more than half as much as the entire coal-fired output in the United States (Forsythe, 2014). However, some of these power plants may not be built, or may not even be put into operation after they are completed due to the recently tightened control on outdoor air pollution to respond mainly to the rage of its citizens as well as the CO_2 pollution to the international pressure on climate change. The reason why there are more coal-fired power plans being built on paper was partly because of the excessive domestic capital needing outlets for reinvestment (Myllyvirta, 2015).

Table 5-3 China's Primary Energy Consumption and Composition

Year	Total Energy Consumption (10,000 tons of SCE)	As Percentage of Total Energy Consumption (%)			
		Coal	Crude Oil	Natural Gas	Hydro, Nuclear, Wind Power
1992	109170	75.7	17.5	1.9	4.9
1993	115993	74.7	18.2	1.9	5.2
1994	122737	75	17.4	1.9	5.7
1995	131176	74.6	17.5	1.8	6.1
1996	135192	73.5	18.7	1.8	6
1997	135909	71.4	20.4	1.8	6.4
1998	136184	70.9	208	1.8	6.5
1999	140569	70.6	21.5	2	5.9
2000	145531	69.2	22.2	2.2	6.4
2001	150406	68.3	21.8	2.4	7.5
2002	159431	68	22.3	2.4	7.3
2003	183792	69.8	21.2	2.5	6.5
2004	213456	69.5	21.3	2.5	6.7
2005	235997	70.8	19.8	2.6	6.8
2006	258676	71.1	19.3	2.9	6.7
2007	280508	71.1	18.8	3.3	6.8
2008	291448	70.3	18.3	3.7	7.7
2009	306647	70.4	17.9	3.9	7.8
2010	324939	68	19	4.4	8.6
2011	348002	68.4	18.6	5	8
2012	361732	66.6	18.8	5.2	9.4
2013	375000	66	18.4	5.8	9.8

Source: China Statistical Yearbook (National Bureau of Statistics, 2014)

Table 5-4 China's Primary Energy Production and Composition

Year	Total Energy Consumption (10,000 tons of SCE)	As Percentage of Total Energy Consumption (%)			
		Coal	Crude Oil	Natural Gas	Hydro, Nuclear, Wind Power
1992	107256	74.3	18.9	2	4.8
1993	111059	74	18.7	2	5.3
1994	118729	74.6	17.6	1.9	5.9
1995	129034	75.3	16.6	1.9	6.2

1996	133032	75	16.9	2	6.1
1997	133460	74.3	17.2	2.1	6.5
1998	129834	73.3	17.7	2.2	6.8
1999	131935	73.9	17.3	2.5	6.3
2000	135048	73.2	17.2	2.7	6.9
2001	143875	73	16.3	2.8	7.9
2002	150656	73.5	15.8	2.9	7.8
2003	171906	76.2	14.1	2.7	7
2004	196648	77.1	12.8	2.8	7.3
2005	216219	77.6	12	3	7.4
2006	232167	77.8	11.3	3.4	7.5
2007	247279	77.7	10.8	3.7	7.8
2008	260552	76.8	10.5	4.09	8.62
2009	274619	77.3	9.9	4.1	8.7
2010	296916	76.6	9.8	4.2	9.4
2011	317987	77.8	9.1	4.3	8.8
2012	331848	76.5	8.9	4.3	10.3
2013	340000	75.6	8.9	4.6	10.9

Source: China Statistical Yearbook (National Bureau of Statistics, 2014)

Oil

Oil composes 18% of China's energy consumption in 2013, but only 9% of the energy China produced in that year was oil. This signifies that China relies on imported oil a lot.

Currently, China is the world's second-largest oil consumer and oil importer behind the United States. It became the world's second-largest net importer of crude oil and other petroleum products in 2009. The foreign oil dependence, defined as the ratio of net oil imports to the total oil consumption, has been on a constant rise since 1994. The recently greatest dependency ratio happened in 2010 (64.6%), since which it has been decreasing. The U.S. Energy Information Administration (EIA) had estimated that China would surpass the United States as the largest net oil importer by 2014 due to China's

rising oil consumption and increase of domestic supply in the US (USEIA, 2013). But as of the time when this dissertation is completed, the data for 2014 is not yet available to verify this projection. China's oil consumption growth accounted for one-third of the world's oil consumption growth in 2013, and this share is expected to stay the same for 2014.

The government seems to have tried to remedy the increasingly greater dependence on foreign oil by lowering the proportion of oil in both the production and consumption sectors, and also by adjusting the quantities of different oil products. Imports of crude oil go to the production sector while imports of most refined products are for consumption use. Up until 1998, majority of the net imports was refined products. Since 1999, China has mostly imported crude oil and increased its refining capacity to feed its internal oil demand (Appendix C). This change first happened in around the end of last century, with a faster decline in oil production and increasing consumption of refined products, such as motor gasoline and fuel oils. These products were the essential and exclusive demand from industrial and household sectors in China's speedy industrialization and urbanization at this time.

There was a seeming substitution effect between coal and oil in China's energy production. Around 1999-2001, the production of coal was on a slow but steady rise. In other words, while the proportion of oil in the energy production mix fell, coal was used more instead to feed the expanding demand. On the other hand, the increasing coal consumption from 2001 complements this finding as well. Coal became a substitute for

oil as a strategy to reducing the importance of oil in the energy mix when the dependency on foreign oil leaped from 41% to 52% from 2002 to 2004 (Appendix B).

Others

As for natural gas and non-fossil fuels, the former takes about 4% in both energy consumption and production, but has been increasing rapidly in recent years. Natural gas is a major "cleaner" alternative to coal and oil, so China has sought to secure its imports via pipelines from central Asia (Turkmenistan) and Myanmar. Since 2010, Chinese companies have reportedly spent up to US$ 8.5 billion on unconventional oil and gas projects in the United States. In particular, there have been recently a number of high profile investments related to liquefied natural gas (LNG) by Chinese corporations (White & Phua, 2014).[44]

In the meantime, nuclear and renewable sources (including hydro, wind, solar and others such as biomass) have been booming in recent years as well. Their growth between 2005 and 2011 was more than double, but their shares in the total energy use were still low, thus are unlikely to become major energy sources for commercial use in China in the near future. For the 12th Five Year Plan period, targets for non-fossil fuel sources have been set to reach 11.4% in the primary energy consumption mix by 2015, and 15% by 2020.

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[44] Some cases are Sinopec's acquisition in 2014 of a 15% stake in the Pacific Northwest LNG project in British Columbia, Canada; CNOOC's US$ 18 billion acquisition in 2013 of Nexen, a Calgary based company that has large oil sand and shale gas reserves in western Canada; CNOOC's US$ 1.93 billion acquisition in 2013 of additional interests from the BG Group of the Queensland Curtis LNG project in Australia (White & Phua, 2014).

The recent rapid expansion of solar and wind power in China has called

worldwide attention. China has become the largest manufacturer of photovoltaic panels

since 2008, and Chinese companies has taken almost 18% of the market share of the

global wind turbine supply, only slightly behind Germany (21%), as of the end of 2014

(Energy Digital, 2015). In terms of domestic capacity, China is now the largest investor

in these two types of alternative energy among nations, and has led the world in new

capacity installations since 2009 (Pew Environment Group, 2010; REN21, 2015). The

total renewable energy capacities China currently possesses were estimated to be 153

GW (hydro excluded), about 23% of the that of the entire world (REN21, 2015, p. 33).

Despite all the impressive accomplishments, developing renewable energy

resources has been facing considerable challenges that can become substantive

constraints. First, the comparative economic efficiency of renewables, particularly the

solar and wind power, is discounted because of insufficient infrastructure. For example,

though the total installed capacity for wind power in China has been the greatest in the

world, 20-30% of the generated electricity has been discarded for no grid access (Wong

& Zhu, 2015). Many wind farms in China are located in remote western areas where

energy resources abound but small population provides little incentive for grid

construction by State-run grid operators. The profit margin on wind power to them is

generally lower than that on coal-based electricity, resulting in higher prices and waste of

productivity in the wind industry. The vicious circle is also seen in the case of solar

power. The over-capacity due to excessive, policy-driven investment has put many

Chinese solar panel companies at risk since the export setback due to the Great Recession.

Suntech, a Jiangsu-based Chinese company that was once the biggest solar cell manufacturer in the world, declared bankruptcy in 2013. The under-utilization of generated electricity for lack of smart-grid integration is a main block for bringing down the prices and the commercialization of solar energy.

The second and related problem is that not only regular grid is needed, but also smart electric grid is essential in the deployment of renewable energy. To date, the degree to which each of the smart grid technologies differs, adding to the uncertainty for the general applicability of renewable energy in the near future. Moreover, the Chinese government has input significant public investment in energy technology innovation to moving up the value chain, and policy efforts such as encouraging renewable financing, simplifying administrative procedures, and promoting "green credit" (China Dialogue, 2014). In short, whether these measures will be effective to stimulating energy innovation for China remains a question; technological bottleneck remains a key material constraint on China's renewable energy industry.

The market reforms of the domestic energy sector is another highly complicated and controversial issue impacting the renewables market. Half of the coal consumption in China attributes to electricity generation, and the important nexus between coal and electricity businesses had been regulated by the government by supervising contracted coal supply to the power companies even after the coal industry became marketized in the 1990s. The attempt to marketizing the electricity industry has been done several times in the past decade, but the most recent policy to abolish the contracted coal supply in 2013 is considered the most significant step. It is expected to cut down the reliance of the

power companies on the cheap coal guaranteed by the state, and to stimulate competition in the electricity generation industry and create market space for alternative energy options. More importantly, as the current electric grid industry in China is substantively monopolized by the State Grid Corporation of China, this market reform may introduce competition into the grid business and related technological developments (Q. Wong, 2014).

Finally, the rapid advancement in China's renewable energy has caused negative ecological impact, seemingly calling into question the hope for protecting the environment by developing alternative energy. The production process of solar cells is highly energy and pollution-intensive. For every kilowatt capacity of a solar cell, around 10 kilograms of polycrystalline silicon are needed, which requires 6 kWh of electricity for manufacturing this major elements of solar cells. Coal has produced constantly around 80% of the CO_2 emissions of China over the past three decades (Figure 5-1). When the total carbon pollution grew at a 9% rate annually between 2002 and 2012, the emissions due to coal consumption grew at 9.3% per year as well (Appendix D). Besides CO_2, another byproduct, silicon tetrachloride, is a very toxic substance emitted during the manufacturing of polycrystalline silicon and its recycle is costly. Most of the photovoltaic companies in China do not have proper equipment to manage this toxin. Hydropower is another compelling case. Most of the damming projects in China, including the Three-Gorge Dams, have been criticized for destabilizing seismic conditions, destroying forests, spreading pollution, endangering animals and displacing people. Because it is relatively "cheaper" (in terms of construction investment) and supply is more stable than solar and

wind power, the central and local governments have sought a considerable increase in

hydropower in order to meet the energy targets for the 11th Five Year Plan.

The use of fossil fuel and massive industrial development have produced severe

pollution, but pollution controls were ineffective particularly in the non-state-owned

enterprises. China's reliance on fossil fuels and its poor implementation of pollution and

efficiency technologies have contributed to severe air and water pollution and public

health hazards.

Figure 5-2 CO$_2$ Emissions of China by Energy Type
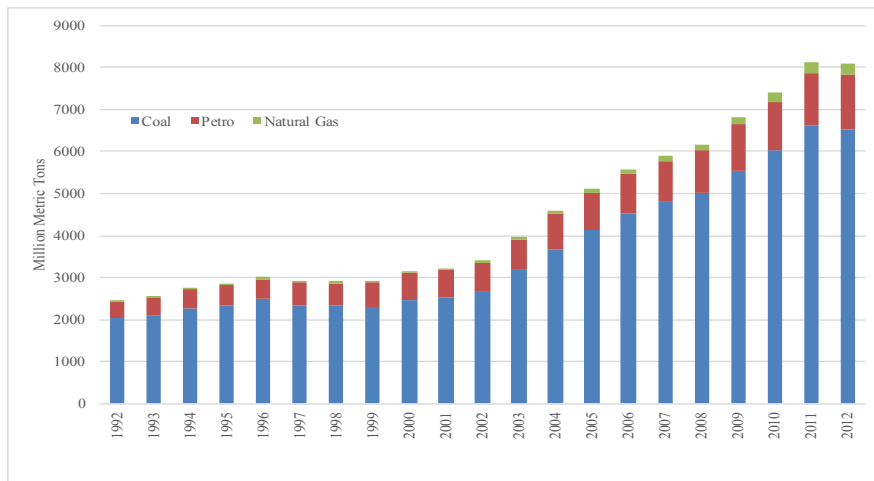
Material Force III: Environmental Quality

Degrading air and water

Among China's many ecological crises,[45] the pollution of air and water are two of

the most serious sources and outcomes. While each of them has interconnections with

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[45] Besides air and water problems, China is facing severe desertification and land loss,
deforestation, loss of biodiversity, and pollution from persistent organic pollutants, among others.

each other and the other types of environmental degradation, they are closely related to the causes and impact of climate change. The burning of fossil fuels, particularly coal, has been confirmed as the major anthropogenic cause of disease-inducing air pollutants such as sulfur oxides, nitrogen oxides, and particulate matter; as well as the heat-trapping carbon dioxide that can raise the temperature in the atmospheric system. Also, as climate change has been changing the weather patterns, enhancing floods and droughts in areas that are already under the risk of freshwater shortage, water pollution can no doubt intensify the crisis.

For China, air pollution being a serious problem is no news. While the poor air quality in the capital city was publicized with much international media attention prior to the opening of the 2008 Beijing Olympics, air pollution has been worse and more protracted for other places in the country. According to the World Bank, "20 of the world's 30 most polluted cities are in China, with Shaanxi Province's coal mining city Linfen the dirtiest (Shapiro, 2012, p. 7). The Asian Development Bank (Q. Zhang & Crooks, 2012) has also reported seven Chinese cities were ranked among the ten most polluted cities in the world, and that fewer than 1% of the 500 largest cities in China have met the WHO's air quality standards (p. 55).

China's heavy reliance on coal is responsible for the poor air quality. Approximately 90% of the sulfur dioxide emissions and 50% of the particulate emissions in China result from coal use (Economy, 2010a, p. 309). China is also the largest SO_2 emitter in the world. From a sectoral perspective, the industrial sector produces around 90% of the total SO_2 emissions, and, particularly, the electric power industry makes

around 60% of total industrial SO_2 emissions (Q. Zhang & Crooks, 2012, p. 61). As around 77% of China's electricity generation is based on fossil fuels (USEIA, 2015), 70% of SO_2 emissions can thus be attributed to the combustion of fossil fuels, with coal being the major part of it.

Another source of air pollution, primarily in cities, is the vehicular exhaust. Up to 2007, the number of privately owned vehicles had increased at a compound rate of 26% per annum, starting at zero in the late 1980s. The number of civilian vehicles had gone 3,200% higher than it was in 1978 (Q. Zhang & Crooks, 2012, p. 61). Vehicular exhaust consists of pollutants such as nitrogen oxides, carbon monoxide, hydrocarbons, and fine particulates.

From a temporal perspective, however, the overall air quality China has been improved since 2007. The industrial SO_2 emissions have be on the decline after a significant hike between 2003 and 2006 because of the rapid industrial expansion in the first part of the last decade. Tougher measures under the 11th Five-Year Plan (2006-2010) have been enacted to close down small and inefficient factories and power stations and ensure more thorough enforcement of existing regulations. Compared to the SO_2 emission trends, particulate emissions (soot and dust) have been declining since at least the late 1990s. Besides policy factors, structural changes within the industrial sector, and increased availability of technologies that improved energy efficiency and waste treatment have contributed to reduce the overall air pollution loads. However, regional disparities exist. Pollution situation gets better in some areas but worse in the others. For example, between 2007 and 2013, SO_2 emissions were lowered from 1.52 to 0.87 million

tons for Beijing (42% lower), while those in Gansu Province, Tibet and Xinjiang increased by 0.39 million tons (7%), 2.5 million tons (43%) and 0.022 million tons (52%), respectively.

Compared to air pollution, water pollution in China is less noticed to the international public but no less serious with an even longer history. Among the three events that marked 1972 as the beginning of China's environmental protection history—blackening of the beach at Dalian Bay, discovery of tainted fish appearing on the Beijing market from the Guanting Reservoir, and the United Nations Conference on Human Environment in Stockholm, Sweden—two of them were directly related to pollution of water bodies. The coast off of Tianjin, the fifth most populous metropolis with the highest per capita GDP in the country, has become heavily contaminated by chemical discharge from factories along the Hai River and tributaries, which enter the Bohai Bay, causing the Bay itself to have experienced frequent red tides in recent years.[46]

The first problem with China's water is the scarcity and continued withdrawal of freshwater resources (Khan & Liu, 2008, pp. 5–7). Currently, with China's enormous population, the Chinese per capita internal freshwater resources is about one-third of the world's average and one-fifth of that in the United States. Also, this amount has dropped from 4425 cubic meters in 1962 to 2072 cubic meters in 2013 (World Bank, 2015). China's largest freshwater lake, Poyang Lake, has suffered severe shrinkage in the recent

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[46] The largest macroalgal bloom in human history occurred in the nearby area, too. In late June 2008, a green tide covered almost the entire coastal area of Qingdao, the host city for sailing regatta of the Beijing Olympic Games. The massive outbreak was observable from the space, said to result from the seaweed aquaculture in the Yellow Sea (Liu, Keesing, Xing, & Shi, 2009).

decade partly due to the construction and operation of the Three Gorge Dam. In December 2013, it recorded its ever lowest water level as 7.5 meters (Davidson, 2014).

The second problem is the degrading quality of these scarce resources. The quality of China's surface water, including rivers and lakes, has been deteriorating. About 30% of the river water throughout the country is evaluated as unfit for human use, and "more than half of the groundwater nationwide is categorized as 'polluted' or 'extremely polluted,' according to government statistics (Ivanova, 2013). For example, one-fifth of the Yellow River is not supposed to be used for drinking, irrigation, or energy production. Elizabeth Economy, depicted the "death" of the Huai River in the opening paragraph of her most recent book on China's environmental problems:

> In late July 2001, the fertile Huai River Valley—China's breadbasket—was the site of an environmental disaster. Heavy rains flooded the river's tributaries, flushing more than 38 billion gallons of highly polluted water into the Huai. Downstream, in Anhui Province, the river water was thick with garbage, yellow foam, and dead fish (2010, p. 9).

Economy has presented a saga in which how damming, floods and droughts, poor regulations on waste discharge, inappropriate central policy design, and the lacking local commitment altogether resulted in the terminal status of the Huai River, as well as the chronic pollution of many other rivers and lakes in China. The situation for Chinese lakes is even graver than that of the rivers. Based on government statistics, 50 to 68% of the water of key lakes and reservoirs was ranked as Grades V or V+ (poor and extremely poor) and under 10% as Grades I and II (good and fair)[47] over the period between 2003

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[47] China's environmental and resource authorities use a six-level scheme for grading the surface water quality of their monitoring points. Grade I water is completely unpolluted water that is

and 2009, while river water still had as least 40 to 68% that was categorized as Grades I and II (Zhang & Crooks, 2012, pp. 38–42).

Related to the surface water pollution, groundwater pollution is another insidious and dangerous problem. China's groundwater provides 70% of the country's total drinking water, but it is under threat increasingly due to hazardous waste, polluted surface water, and runoff pesticides and fertilizers. Aquifers in 90% of Chinese cities were polluted[48] (van Wyk, 2013). The government has confirmed that, as of 2014, 61.5% of the tested groundwater nationwide is polluted to the extent of "poor" or "extremely poor" quality, and so is 85% of the groundwater in the densely populated Northern China plain (MEP & GoPRC State Council, 2015, pp. 16–7). Contaminated groundwater unavoidably contributes to contaminated soil. Although the Chinese government has conducted the nationwide soil survey of since 2006, it did not formally released the findings until April 2014, two month after it denied a civil request of the soil information in the name of "state secret" and made overwhelming domestic and international media repercussions. According to these latest official data, 16.1% of the country's soil is polluted, including nearly 20% of farmland. 83% of the polluted land was tainted by inorganic material, most common of which were cadmium, nickel and arsenic (E. Wong,

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suitable for drinking without treatment. Grade II is water that is drinkable after treated and is suitable for rare aquatic species and spawning grounds. Grades III and IV are moderate quality that is suitable for general industrial or recreational uses that do not involve direct human contact. Grades V and V+ are considered unfit for human touch or any actual use.

[48] This finding was originally found in the draft text of the National Plan for Preventing Groundwater Pollution 2008-2020, released jointly by the Ministry of Environmental Protection and the Ministry of Land and Resource in July 2008, but when its final version got promulgated in 2011, the figure was deleted.

2014). The most recent annual report of the Ministry of Environmental Protection has

noted the respective percentages of land polluted by each of them as 7.0, 4.8, and 2.7%

(MEP & GoPRC State Council, 2015, p. 46)

Numerous studies have confirmed that environmental pollution can negatively

impact the human and the other species in many ways. The bad air quality resulting from

coal-based heating during wintertime in the Northern China caused a resident to have a

five-years shorter life expectancy than her non-resident fellow citizens (Chen, Ebenstein,

Greenstone, & Li, 2013). Besides toxic gases of SO_2 or NO_2, suspended and fine

particulates are the top reason for health and life hazards.

Particulate matter, including PM10 and PM2.5, is a severe threat to human health.

PM2.5 refers to fine particulates that measure 2.5 microns or less in diameters. They are

small enough to pass through the throat and nose, entering deeply into the lungs and

bloodstream and causing serious health effects on the lungs and heart, including ischemic

heart disease, stroke, lung cancer and chronic obstructive pulmonary disease (Burnett et

al., 2014).

PM2.5 has been confirmed as the primary pollutant for the recent outbreaks of

smog—appeared as "Airpocalypse" on the Western media—in many industrial cities in

China. The Chinese authorities used to refuse to reveal information about the particulates

concentration; formal research activity was unlikely, nor could the publication of data or

estimates by foreign actors proceed without interference (E. Wong, 2014). Starting from

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2011, the particulates concentration data have become available in official statistics.[49]

Based on the readings of PM2.5 in 31 major cities (provincial capitals and province-level municipalities) in 2013, a Chinese research team calculated that the premature deaths from PM2.5 pollution-related diseases in the year came to 257,000. That is an average rate of around 0.1%. This is reported to be higher than those of cigarette smoking (0.07%) or traffic accident (0.0009%) (Greenpeace, 2015). The numbers for 12 out of those 31 cities were even greater than 0.1%, converted to more than 134 deaths per 100,000 people per year. Shijiazhuang (Hebei Province, northern region), Jinan (Shangdong Province, northern region), Changsha (Hunan Province, central region) were the three locations with the highest rates of PM2.5 pollution-related premature death (Greenpeace East Asia, 2015).

Unsafe water in China has supplied nearly 700 million people with drinking water in the urban areas, as less than 25% of the river water is considered suitable for drinking or fishing. In the rural areas, that treated piped water is not available for two-thirds of the rural population is a leading cause of death among children under the age of five in China (Economy, 2010a, pp. 331–314). One-third of China's land suffered from acid rain, which is caused by emissions of SO_2, in terms of erosion of buildings, diminishing of agricultural output and poisoning of water bodies thus water and fishery resources (BBC, 2006).

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[49] China Statistical Yearbook, the annual publication by the National Statistics Bureau, started to include the annual average quantity of PM10 of 31 major cities (provincial capitals and province-level cities) from 2011, and PM2.5 from 2013, respectively.

At least 459 Chinese villages with severe air, water, or soil pollution also have cancer death rates that are far above the national average. These "cancer villages," while being denied of their existence by the authority until February 2013 (He, 2014), were revealed to the world with the collective effort of the media and Internet. Typically, they are located in poor counties near major cities in the wealthy Eastern part of the country, but they are currently distributed across 29 of China's 31 provinces (Liu, 2010), and are anticipated to increasingly spread westward due to continuous industrialization and urbanization.

Institutional Force: China's Climate Policy-Making Model

The first character of the institutional basis for China's climate is the wide range of functionality and responsibility being spread in the overall policy process, which involves a few governmental bodies as major actors, and semi-official organizations and individuals as secondary actors. The Weberian rationalization of each of bureaucratic unit represents interests in economic growth, environmental protection and research/scientific enterprise. And the changing status of the individual bureaucratic unit reflects the change of focus on the complex climate change issue in China.

The second distinctive character of the Chinese climate policy-making process is the coordinating role of the special "coordination committee" or "leading group" that consists of the head of the government and chief officials from various branches inside or outside the State Council. This group of around 30 people resembles the brain for making China's climate attitude and behavior, but the representatives from the economic affairs branch now have the most power in influencing policy outcomes.

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The economic considerations to the climate issue have been harnessed by the

National Development and Reform Commission (NDRC, 国务院发展与改革委员会)

and its predecessor. The NDRC, succeeding the State Planning Commission (SPC) and

State Development and Planning Committee (SDPC), is the locomotive of economic and

social development policies in the Chinese central government.[50] It bears the main

responsibility for drafting Five-Year Plans, the most authoritative official documents

outlining the government's directives on economic and social development of the

country. On the climate work, it had been the host of the Climate Change Office, the

secretariat to the National Climate Change Coordination Committee (NCCCC) since

1998.

The NDRC is also the most influential bureaucratic actor in China's energy

policy. China does not have a separate energy ministry, whereas the Energy Bureau has

had primary responsibility for China's energy industry since 2003. The Energy Bureau

was assigned the responsibility for energy supply, while the power over energy

consumption and efficiency belonged to the Department of Environment and Resources

Conservation. In 2005, with the increasing salience of energy issues in the economy and

the politics of China, the National Energy Leading Group, a high-level taskforce led by

Wen Jiabao was established. Its mission was set to determine the grand strategies on

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[50] This governmental unit had been called State Planning Commission between 1952 and 1998. This organization was renamed as the SDPC in 1998, expected to carry out the mission of China's market-oriented transition and the economic macro-management. Then in 2003 the SDPC was reorganized as a newly created NDRC, which merged State Council Office for Restructuring the Economic System and part of the State Economic and Trade Commission. The word "planning" was removed for good from the name of the most important governmental organization overseeing the economic development of China.

energy for the country. To serve the executive needs of this Leading Group, the Office of the National Energy Leading Group was set up and the NDRC chairman was appointed as the head of the office. Furthermore, a new post as vice-chairman was created to be in charge of energy and environment, and was given to a former minister of the State Environmental Protection Administration (SEPA). These changes indicate that energy issues have been elevated to the highest political level and that there is a specific focus on climate (Heggelund, Andresen, & Buan, 2010, p. 237).

The Ministry of Environmental Protection (MEP) is currently the highest-level governing body of environmental policy planning, supervision, evaluation, and coordination of enforcement efforts. The earliest predecessor of the MEP was the State Council Leading Committee on Environmental Protection (国务院环境保护领导小组) in 1973, established after the United National Stockholm Conference in 1972. This ad hoc committee was later normalized to become the Environmental Protection Bureau (国家环境保护局) under the Ministry of Urban-Rural Development and Environmental Protection in 1982, and then further promoted to the ministerial level as the National Environmental Protection Administration (NEPA, 国家环境保护总局) in 1988. In the organization of the Chinese government, despite their same level in the formal organizational hierarchy, a ministry differs from an administration in that the former is part of the cabinet, the highest decision-making body in the State Council, while the latter is one type of the affiliated organs of the State Council (国务院直属机构) and is granted more implementing power than decision-making power over an issue. In general, affiliated organs of the State Council are responsible for carrying out the policies

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designed by the cabinet and stamp-approved by the People's Congress, and their path to influencing the policy-making is often more indirect as they are viewed as more technical and professionalized bureaucratic units. This is one institutional explanation why the NEPA was considered to have much less say than the economic representatives in the domestic politics during the formative period of the climate policy (1989-2005), because the NDRC (along with the SPC and the SPDC) has been a cabinet member but the NEPA was not. And this is also why the institutionalization of MEP was deemed an essential promotion in the regard of political prominence of environmental issues in China, for not only the environmental interests can now participate directly in the debate and discussions at highest-level executive meetings in the government, thus more possibly shaping the national development strategy; but also the pro-environment directives are now co-signed by the MEP and the State Council together when they are sent to the local governments, thus increasing the authority of the pro-environment policies mostly drafted by the MEP as well as the pressure for compliance at the local levels.

The China Meteorological Administration (CMA) and the Chinese Academy of Sciences (CAS) are the two of the lead agencies to provide scientific evaluations on climate change. The CMA had led China's climate change policy in the early 1990s, until the leadership role was officially replaced by the NDRC in 1998 (Harrington, 2005, p. 111). However, it still is the portal of scientific communication between the Chinese government and the IPCC, and its former chief administrator, Qin Dahe, has been the co-chair of the IPCC Working Group I since 2002, leading the completion of the Group's fourth and fifth assessment reports. The CAS, along with other research-centered

institutions, is an important origin of the expert community on climate change in China. In addition, the Ministry of Science and Technology (MST) is another actor with stakes in science and research. Firstly, it funds research projects on energy and environmental technologies, and is considered sympathetic to environmental concerns. Secondly, it is in charge of the scientific research and technology transfer as the portal between China and the Clean Development Mechanisms (CDM). It has played a central role in laying the ground for the development of CDM projects in China, and its officials serve as the Chinese representative on the Executive Board of the CDM at the UNFCCC (Heggelund, 2007, p. 173). Twenty-eight Chinese experts were selected for the write-up of the fourth assessment report of the IPCC (Heggelund, 2007, p. 169),[51] and the number of Chinese experts increased to forty-two for the fifth assessment report published between 2013 and 2014 (IPCC, 2014b).

Besides the economic, environmental, and scientific bodies, the Ministry of Foreign Affairs (MFA) is the last but not the least important player which plays a key role in the international political process on climate change. The mission of MFA is to ensure China's political and economic interests to be served in bilateral or multilateral negotiations, so the MFA has shared the general position on the primacy of China's economic needs with the NDRC. Because climate change initially emerged as a "Western" problem in the late 1980s to the Chinese leaders' eyes, MFA has been very

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[51] Scientists have been involved in the climate governance of China, with a shift of role from coordinating to a consulting. But this may not mean science is getting increasingly politically neutral; the ways in which it affects politics can be less institutionalized and more nuanced. Wübbeke (2010) discussed channels via which science and scientists in China have influenced the country's climate policy.

influential in formulating China's response to climate change and has shaped China's international image as a tough negotiator especially at the COPs. It has continually argued to protect China's sovereignty and economic considerations, and that the industrialized countries are responsible for taking the lead on global climate change by helping the developing countries with the technology transfer and funding needed. As such, the MFA sees China as speaking for the interests of the developing world (Heggelund, 2007, p. 173).

Finally, there are 'window agencies' to communicate with international actors, and coordinate different bureaucracies for special policies. For example, the Ministry of Finance has communicated with the GEF and coordinated (Yu, 2008, p. 6) among bureaucratic bodies within the Chinese government on international financial support and technology transfer.

In sum, several actors are engaged in formulating China's climate policy within various state institutions. Currently, the NDRC and MFA are the locomotive of the policy process. The NDRC has responsibility for both economic policy and energy policy, thus setting the agenda on domestic issues that defines the perceived material conditions and limits for climate policy. The MFA has exercised great influence both internationally and domestically as climate change has been a foreign policy matter that is only gaining more weight in the global politics. Within the Chinese government, these two actors have been seen as the "winning coalition"; internally, they supervised the socioeconomic assessment of climate change mitigation in the National Climate Change Assessment, and externally, they have represented China's core national interests on the climate issue. On

the other hand, the MEP and MST belongs to another coalition that pursues more proactive environmental and climate actions, but has had much less influence on especially the climate issue as it is perceived primarily as development (in terms of sustainable economy and energy) and foreign policy issue (Heggelund et al., 2010).

Because of the involvement of multiple bureaucratic units and individuals with divergent interests, one might misunderstand that Chinese climate policy-making is fragmented and thus inefficient and ineffective (Marks, 2010; Gilley, 2012).[52] The making of climate change policy, as part of the foreign policy, centers on coordination and consensus-building among units and sub-units with broad common goals (Yu, 2008, pp. 17–20). These goals are usually strategic rather than substantive, and have been approved and assigned by the top party and government leadership.

What I would argue is that, the Chinese coordination model is efficient in decision-making because of its "consensus-ensuring" character, but whether the "consensus" can be communicated successfully largely depends on the attitude or position the top leaders hold. And policy effectiveness would be a different matter.

Yu (2008) explained the Chinese "consensus building (Tong Yi Kou Jing)" as follows:

> When Chinese government express[es] consensus toward some international regimes, obey[s] the norms of international regimes, and acquire[s] interests according to procedures of international regimes, different bureaucratic sections try to achieve policy making and policy implementation through communication, consultation, and bargaining…[O]n climate change policy, the final policymaking mostly occurs at the coordination level. (p. 19).

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[52] They adopt the concept and framework of "fragmented authoritarianism (K. G. Lieberthal & Oksenberg, 1988)"

If Yu's description is accurate, what drives communication and bargaining within the Chinese government among bureaucratic sections is achieving a policy orientation or goal that has been announced by the top leadership. Therefore, this mechanism (Tong Yi Kou Jing) is closer to "consent-ensuring" instead of consensus-building, as the highest-level decision has been done and imposed on the bureaucratic actors. Although this understanding does not mean bureaucratic actors do not have flexibility or power over the policy process, it does suggest that in the context of the authoritarian nature in the governing order of the regime, decision-making can be quick and smooth among sub-national actors with conflicting interests or identities. But the degree to which the quickness and smoothness of the process to transform a policy goal into practical implementation may largely depend on how serious the top leadership treats the goal.

In practice, a cross-sectional unit is necessary in order to coordinate among the multifarious institutional actors. The initial setup in 1990 was a coordination committee under the then Environmental Protection Committee of the State Council, with Mr. Song Jian[53] as the chair. The executive function of the committee was assigned to State Meteorological Administration, leading the other ten units from across the entire government: Ministry of Development and Planning, Ministry of Foreign Affairs, Ministry of Science and Technology, State Economic and Trade Commission, Ministry

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[53] Mr. Song is a cybernetics scientist and technician with a doctorate degree from the former Soviet Union. His academic background made him one of the principal architects of China's anti-ballistic missile system and the policy on population control. He was State Councilor, one of the ten most powerful political officers under the Premier and Vice Premiers in the Chinese system of government, as well as the director of State Science and Technology Commission and when appointed the Coordination Committee chair in 1990 (NCCU, 2015).

of Finance, State Environmental Protection Administration, Ministry of Construction, State Forestry Administration, State Oceanic Administration and Chinese Academy of Sciences. Later during the government restructure in 1998, this organization was replaced by the National Coordination Committee on Climate Change (NCCCC, 国家气候变化对策协调小组) under the SDPC, chaired by Mr. Zeng Peiyan, then SDPC Chairman and Vice Premier of the State Council. This marked the shift in the official recognition of the climate change problem from being a scientific-technological challenge to an economic and development task.

The NCCCC was updated for the first time in 2003 as part of the institutional adjustment of the State Council. The adjustment replaced the SDPC with the NDRC, therefore transitioned the chief of office on the Chinese economic policy and climate policy to Mr. Ma Kai, Mr. Zeng's successor. This decision re-confirmed the prioritization of the economic dimension in climate policymaking.

The latest major transformation of the centrally-coordinating organization took place in 2007, changing the NCCCC to the National Leading Group on Climate Change (NLGCC, 国家应对气候变化领导小组). The significance of a Leading Group is that it signals the attention from the highest level of leadership to the climate change issue, for it includes the Premier and Vice Premiers as leading members to preside meetings among twenty-nine head ministers and officials. The establishment of the NLGCC is therefore considered an elevation of the climate change issue from a relatively executive agenda to a primary national-security agenda. This highest-level organization finalizes national strategies and plans on climate change in areas of coordination of policies within the

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government and domestic mitigation and adaptation, as well as international negotiations. Its most recent adjustment took place in July 2013 to include 33 officials from 27 bureaucratic units in the State Council. Only the NDRC has more than two seats in this Leading Group.[54]

Ideational Force I: Philosophical Traditions

Many studies have regarded the relationship between economic development and environmental protection a necessary contradiction, and attributed the environmental problems in China today to it. It appears that that it was an unavoidable and unintended consequence of the voracious pursuit for GDP growth of the Chinese state and society altogether, and that China was repeating the old development path taken by the now highly-industrialized Great Britain or the United States, albeit with a greater speed. This assumption is not entirely true. China's environmental crises today partly result from people and leaders' intentional negligence on the matter of protection the environment. During Mao's era, environmental problems were not regarded as an issue in socialist China as they were supposed to only belong to the "capitalist" nations (Qu, 2000, p. 12). Environmental concerns were intentionally ignored under Mao's reign; both the government and the general public neglected the conservation of nature and natural resources, which resulted in large scale deterioration of natural ecosystems and disruption of many ecological processes (Edmonds, 1999). They also were mentioned just

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[54] The 2013 State Council reform was the first reform after the new government under Xi Jinping and Li Keqiang assumed power. The roster of the current NLGCC is available at http://www.gov.cn/zwgk/2013-07/09/content_2443020.htm

occasionally and conditionally in the two decades after the launch of the market reform between the late 1970s and mid-1990s.

In my view, the Chinese civilization did not have systemic and influential ways of thinking and talking about the environment or human-nature relations perhaps until the 1980s even 1990s. Ancient literature and philosophical traditions indeed commented on nature. For instance, Taoist classics and Shan-Shui poetry appreciate the aesthetic value and express spiritual feelings about nature. But they were not equivalent to the ecological thoughts in the modern sense because when "nature" was referred in their texts, the contexts were usually either metaphorizing the scenery for literary creation, or depicting nature as "everything as it is." In other words, there seems to be very little signs of structure nor agency. After all, as some have pointed out, generally the Chinese philosophical thoughts do not hold a subject-object separation and division (Mou, 2005). Additionally, several classics on history, governing techniques, or political ethics had addressed coping natural disasters, water-utilization, agricultural and economic management in society, they rarely examine the subject of nature-human relation explicitly, thus cannot be viewed as ecological or environmental philosophy.

Nevertheless, ancient philosophical ideas can provide intellectual resources for modern interpretations. Environmental historians have acknowledged that pre-modern China possessed a rich cultural tradition of environmentalism. With regard to views on nature, literary and artistic references abound in the Chinese classic poetry and painting. A respect for nature and an appreciation of its importance and beauty characterize these

works and highlight the environmental tradition from the intellectual-elite perspective (Hou, 1997).

In contrast, views from the mass culture tended to portray nature as a force to impose hardships on men, so great efforts and persistence were requisites to overcome the hardships or even alter the origin of problem—the physical nature. The success was therefore deemed worth praise and honor from others. One Chinese folktale of *Hou Yi* tells the story of a mythological legendary archer who shot down nine of the ten suns that were burning the earth, thereby saving the earth and becoming a world hero. Another myth of Yu, who successfully stopped floods of the Yellow River after working for thirteen years without going home even when he passed by his house for three times, eventually solved the gravest natural disaster for China in the ancient time and became the founding emperor, Yu the Great, of the Xia dynasty (c. 2070-1600 B.C.E.). He is generally admired as one of the most respectable emperors in Chinese (mythical) history.

With regard to the relationship between human and nature, the traditional philosophical thoughts—typically Confucianism, Legalism, Taoism and Buddhism—demonstrate influential ideas in the Chinese environmental tradition. Understanding them can inform the intellectual and discursive origins of the practices in political and economic contexts, because these philosophies have "influenced Chinese authorities, elite and popular attitudes, and the overall ordering of Chinese society in ways both distinctive and important for the natural environment" (Economy, 2010b).

The discussion below will focus on how each of the Chinese philosophy approaches the question of human-cosmos relationship as reflected in their respective principles regarding social relations.

Confucianism

Although Confucianism is by no means a single unified discourse and many strands of thought have been developed throughout 2500 years of time, a set of moral ideas such as benevolence (*ren*), propriety (*li*), righteousness (*yi*) are commonly upheld. The epistemological foundation for the functioning of these values, on which the Confucian social order is based,[55] is harmony (*he*) in terms of a "healthy, stable interplay" between different entities (Li, 2006, p. 588). These entities include all human and non-human subjects. In a typical Confucian view of the world that contains a triad structure of *tian* (sky/heaven), *di* (earth) and *ren* (man/human), the conception of harmony presumes that the original condition for human to live in the world is a healthy and stable one under *tian*. *Tian* as heaven refers to an impersonal but the ultimate source of life, political power, and spiritual authority; it governs the entire universe, including the earth (*di*) and mankind (*ren*). *Di* is close to the current Western notion of nature, referring to the physical non-human beings such as land, forests, mountains, rivers, rocks, etc. Since *tian* is the source and generator of moral principles and symbolizes the

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[55] In the general Confucian vision, society is composed of "five fundamental relationships": ruler and subject, parent and child, husband and wife, elder sibling and junior sibling, friend to another friend. Under this social model, as long as the first subjects in each dyad behaves in accordance with the Confucian moral values and the second subject respects the first accordingly, then both of them are considered fulfilling their personal and social duties, thus harmony and freedom from conflict would be assured.

original, righteous order, the purposes for *di* and *ren* are defined to maintain the harmonious order: the role for *di* is to nourish and support the needs of *ren*, and *ren* is supposed to appreciate the giving from *di* and respect for both *di* and *tian*. In the literature, this triad has a common parallel to one's filial relationships, in which *tian* is analogous to the father and *di* to the mother. Therefore, the triad is also clearly of a hierarchical structure down from *tian*, *di* and to *ren*, since both the earth and mankind should fulfill their purposes under the heaven's principles (Murphey, 1967, p. 314).

However, the Confucian thought grants much higher agency to human than it appears to be in the worldview depicted above. For *ren* is an indispensable integral part of the triad, the universe would be meaningless without this element. It is also human that is the agent to realize all the virtues derived from *tian*, thus Confucius himself and many of his followers put a great emphasis on education and self-cultivation because it is believed that though the human nature is good and the world is harmonious in the very beginning, sometimes bad influences prevail and harmony gets disrupted, so human efforts are genuinely needed to gain the right balance back. In a sense, the core of the Confucianism as a humanist philosophy lies in the persistent efforts to align personal values and behavior with the principles of *tian* (天道) at the individual level, and to safeguard harmony and carry out harmonization at the collective level (Tu, 1993, pp. 1–56; Li, 2014, pp. 6–7).

The centrality of the role of mankind in Confucianism has invoked two distinct interpretations regarding the legacy and impact of the Confucian thought on China's environment. Some have argued that Confucian ideas, especially those related to inter-

entity harmonious relationships, espouse a great respect for nature (Kassiola, 2010; Li, 2006). Laws of the nature regarding natural resources were particularly proposed by key Confucian thinkers to advise regular people how to utilize the environment (i.e. the earth/*di*). For example, in the *Rites of Zhou*— a Confucian classic on the theory of bureaucracy and political organization published in the Warring States period (403-221 B.C.E.)—It was stated that local governors were responsible for protecting mountains, forests, rivers, and animals. Mencius, once counseled a King that "plant the crops according to the changes of season, you will have more food than you want; limit the size of the holes in the net, you will have more fish than you want; bide your time to fell the trees, you will have more fuelwood than you want."[56]

However, it may be problematic to say that Confucianism's influence is irrelevant to the Chinese environmental degradation. China has a "three thousand years of unsustainable" relationships with nature (Elvin, 1993) in terms of "cereal cultivation, re-engineering by hydraulic works for drainage, irrigation and flood-defense, and deforestation for the purposes of clearance and the harvesting of wood for fuel and construction" (Elvin, 1998, p. 733). Although the link between cultural tradition and economic behavior can by no means be deterministic, one would notice the human-centered quality in Confucianism has been a likely force added to the anthropogenic demands as agriculture, water development, and deforestation. The address by Mencius

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[56] This passage is from the chapter of Liang Hui Wang I in *Mencius* and is often cited as a textual evidence for the environmentally- friendly attitude of the Confucian thought; quoted in (Mao, 1994, p. 43).

quoted above was immediately followed by his real concern—what makes of a good

king. As he said, once the grain, fish, and wood become more than needed,

> …this will mean that the people can nourish their lives, bury their dead, and be
> without rancor. Making it possible for them to nourish their lives, bury their dead,
> and be without rancor is *the beginning of kingly government* [emphasis
> added]…Let mulberry trees be planted around households…people of fifty will be
> able to be clothed in silk…do not neglect the appropriate breeding times, and
> people of seventy will be able to eat meat…do not interfere with the appropriate
> seasons of cultivation, and families…will be able to avoid hunger. Attend
> carefully to the education provided in the schools, which should include
> instruction in the duty of filial and fraternal devotion, and gray-haired people will
> not be seen carrying burdens on the roads. The ruler of a state in which people of
> seventy wear silk and eat meat and where the black-haired people are neither
> hungry nor cold has never failed to become a true king. (Mencius, 2009, pp. 3–4)

Therefore, talking about proper measures of handling natural resources is meant

to make the proper relationship between the ruler and the subject; engaging with the earth

(*di*) by using right methods is considered beneficial to the living conditions for people

(*ren*) and their social relations. Both the good relation between *di* and *ren*, and that

between different groups of *ren* in society, are part of the harmony project under

heavenly (*tian*'s) wills. Moreover, Confucianism in general praises the mastering of all

kinds of knowledge, including those about nature to better utilize its offerings. While

overuse is discouraged, it nevertheless could stimulate human's will and confidence in

controlling at least part of the great nature. Xunzi, a contemporary of Mencius, expressed

a belief in man's ability to meet nature's challenges and control it for his needs by

articulating the notion of "zhi tianming er yungzhi" (master nature for use) (Economy,

2010b, p. 31). Later, two of Xunzi's protégés, Li Si (c. 284-208 B.C.E.) and Han Fei (c.

281-233 B.C.E.) became proponents of Legalism.

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Legalism

To a certain extent, Legalism is an *Aufheben* of Confucianism. Legalist thinkers generally criticized and dismissed the moralism in Confucianism, but appreciated the Confucian ideal order as the collectivity of proper behaviors, and thought codifying the propriety with concrete rewards and punishment would be the best way to achieve the order. Legalist thought is similar to IR realism or mercantilism in its practical purpose, as the proponents anchored their work to the enhancement of wealth and strength of the kingdoms they served. Building comprehensive legal systems governing political, economic, education, cultural and social, and environmental and population matters was the primary subject of study for Legalist scholars. In order to produce statecraft, epistemic tools such as a simple materialist epistemology (as opposed to the Confucian idealist epistemology) and a theory and political model of "rule by law" (as opposed to the Confucian "rule by sage") were developed.

Therefore, the Legalist approach to the environment was somewhat similar to the modern strategies of resource conservation and management. As an early Legalist, Guan Zhong—the prime minister of the first hegemonic state during the Spring and Autumn Period (771-403 B.C.E.)—advised his people to exploit the nature within a reasonable extent. He asked them "not to raise too many cattle on the grassland, lest it fail to recover from over exploitation; and not to plant crops too close together, otherwise the fertility of the soil would be insufficient (Mao, 1994, p. 43)". Some Legalists argued that a growing population and increasingly scarce supply of food and other goods would require stricter rules and controls on both ends of the supply and demand.

Taoism

In contrast to the human-centric tendency of Confucianism and Legalism, Taoism

holds nature-centrism as its axiom. As China historian Charles Hucker comments,

> Taoism is a lyrical, mystical, but by no means irrational advocacy of
> individualism, quietism, and spontaneity in union with Nature (tao).… Nature is
> conceived as all-encompassing, as an impersonal, purposeless cosmos in which
> everything has its natural place and function; it is what it is for no reason other
> than that it is what it is, and can only be distorted and misunderstood when it is
> defined, labeled, or evaluated by standards such as good and bad that do not exist
> in nature (Hucker 1995, 90; quoted in Economy, 2010b, p. 33).

Nature itself is the ontology of the philosophy; epistemologically, the notion of

nature is absolute and has no social or moral connotation, whereas in Confucianism and

Legalism, "nature" is laden with values based on morality or utility.

Taoism was founded by Laozi (Lao Tzu) and reached its maturity in Zhuangzi's

(Chuang Tzu) works. In his seminal work Dao De Jing (Tao Te Ching), Laozi revealed

the credo of Taoism as "let Nature take its course" with these famous lines: "Earth gives

the rule for people. Heaven gives the rule for Earth. Tao gives the rule for Heaven. *[T]he*

rule for Tao: things as they are (Laozi, 1992, p. 84)". To be noted, while also using terms

of "earth" (*di*) and "heaven" (*tian*) as the Confucians, Laozi argued that these concepts

were subsumed under Tao—the cosmic order and the ultimate law of nature completely

independent of human intervention. Zhuangzi further developed a transcendental notion

as Nature, and founded a value-judging system based on Nature, thereby demonstrating

an environmental theory that is non-anthropocentric, holistic and embraces universal

egalitarianism (Xie & Fang, 2002).

Because of the belief in the absoluteness of Nature, Taoists worship a life of

simplicity and disregard human's willful engagement with Nature except for minimal

subsistence. Acts of state should be limited to enabling people to acquire things from Nature for the same minimal purpose. To some, although such perspective on man-nature relations and the role of the state might protect the environment, it might hinder economic progress and development at the same time.

Buddhism

Unlike the previous three philosophies, Buddhism is not a native thought legacy, but it has created great impact on Chinese society and culture since its entry via India by the second century. The religion was practiced by not only peasants but intelligentsia in some dynasties, and it spread to nations such as Japan, Korea, and Vietnam, which belonged to a common cultural circle, where the Chinese writing system was adopted to circulate goods and ideas, similar to the role of Latin in premodern Europe .

The Buddhist views on the environment are non-anthropocentric. Derived from its religious content, one fundamental belief is all creatures are equal, because in reincarnation, a person could return to the earth as another species, while an animal in the present life could be reborn into a human in the next life, based on the good mind and deeds committed. This notion of spiritual equality can induce a reverence of nature, as all things in the world—living or dead, in the past or in the future—have been connected in the cosmos by a kind of power that may be beyond human perceptibility but by no means contingent. Buddhists in China, therefore, advocated avoiding killing of animals and promote vegan diet. Buddhist monks not only observed these behaviors, but also protected the environment in the mountains in which they typically lived. Mao Yu-shi, a Chinese economist and founder of one of the earliest environmental NGOs in China,

thought that "one-third of the most beautiful and famous scenic areas in China [today] are Buddhist temples surrounded by ancient trees reflects the harmony between man and nature espoused by Buddhism" (Mao, 1994; as quoted in Economy, 2010b, p. 36).

Contemporary Forces

Overall, traditional Chinese philosophies—Confucianism, Legalism, Taoism and Buddhism here—share a general respect for the power and importance of nature. However, as environmental historians have suggested, the official effort to translate non-anthropocentric ideas into actual actions in political and economic developments in China's premodern history was little or hardly successful, mainly because of the imperatives of war, population expansion, and agricultural and economic development (Dunstan, 1998; Elvin, 2004). Furthermore, environmental degradation constantly lurked in much political and social turmoil leading to dynastic changes. Flooding, droughts, deforestation, soil erosion, along with changing climatic patterns impacted food production, creating famines and spurring conflicts among people divided along class, racial/ethnic or ideological lines. Starting as late as the early 19th-century, it was a co-degeneration of economic, social and environmental conditions in China (Zhu, 1972; Zhang, Brecke, Lee, He, & Zhang, 2007).

By the end of the imperial rule in 1911, 80% of Chinese people were employed in agriculture, but most of them suffered from severe poverty and hunger. A republican government in the mainland (1911-1949) was unable to relieve the deteriorating circumstances, while continuous warfare—the warlord era (1916-1928), Japanese aggression, and the nationalist-communist Civil War (1927-1950)—not only directly

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aggravated the levels of degradation by destroying the existing natural resources and resource-management infrastructure, but also deprived any official authority of its ability to mobilize meaningful attempts for improving the environmental decay. Moreover, the communist state established in 1949 seemed to have only followed in the footsteps of its precedent regimes, particularly during the rule of Mao Zedong (1949-1976). Three more ideational factors need to be addressed prior to an investigation of the official discourse in the post-2000 period.

Nationalism

Nationalism in China is largely about the face rather than rationally-calculated material interests. Studies about the history of China in the twentieth-century cannot avoid the theme of "century of humiliation." It is an indoctrinating narrative in standard history textbooks used for school children in China. This history narrative attributes the suffering on their fatherland to the invasion of the imperialist Western powers and Japan from 1840 to 1945. Beginning with the Opium War and concluding with the victory of the Second World War, it is generally perceived that China was treated unjustly not only for its material losses in money and territory, but, more importantly, for the deprivation of respect as the Middle Kingdom in the "Under-the-Heaven" world system of which it used to be the center. It was a sense of self and the self-other connection that was shattered and caused the sentiment of humiliation. This sentiment as a mix of defeated pride, anger and self-inflation, has progressed to become the emotional core of Chinese nationalism, and was carried by the narratives and even transformed into the belief that the contemporary "new" China, following the Communist Party's lead, is proudly

"standing up" and shaking off of the nearer humiliating past, and will regain the glory of an older China—as those powerful dynasties before the mid-18th century—with the hard work of all Chinese people. The belief has been expressed in narratives of patriotism and solidarity, used by the Communist party-state as a means to justifying and mobilizing many political campaigns (Wang, 2008). "Face-saving" is main related concept and an essential element in studying about Chinese foreign policy especially when it comes to issues about international status.

Campaignism

Campaigns in the Communist China are extreme mobilization of the masses by the state. Numerous campaigns took place under Mao with the stated purposes of war preparation, purging the reactionary force, enhancing production output, building socialist utopia, etc. Two of the most extensive ones are the Great Leap Forward (1958-1960) and the Cultural Revolution (1966-1976), both of which caused severe negative impact on China's environment.

Two ideologies sustaining the campaigns were nationalism and man's ability in conquering nature. During the Great Leap Forward, the most advertised official propaganda as "Surpass the U.K. and Catching-up with the U.S." (超英赶美) in crop harvest and iron/steel output epitomized the nationalist motivation of all economic campaigns, including the later "Learning from Dazai in Agriculture; Learning from Daqing in Industry" throughout the Cultural Revolution. Economic progress was perceived more as the first and foremost step toward the nation's honor than the improvement of living conditions for individuals.

One may trace the roots of the "taming-the-nature" ideology back to the

Confucian and Legalist intellectual traditions. Mao himself was convinced of and

committed into the necessity and viability of altering nature for people's use,[57] and mass

mobilization was what he believed to be the effective way. His approach to nature after

he acquired the leadership role of the world's most populous country eventually became

an assault wrecking havoc on China's economy, social fabric, and environment. Judith

Shapiro summarizes this outright anti-nature attitude of Mao and the China under his

rule:

> …[T]hrough concentrated exertion of human will and energy, material conditions
> could be altered and all difficulties overcome in the struggle to achieve a socialist
> utopia… Maoist ideology pitted the people against the natural environment in a
> fierce struggle. To conquer nature, the power of ideas was unleashed through
> mass mobilization in political campaigns, often accompanied by the use of
> military imagery. Official discourse was filled with references to a "war against
> nature." Nature was to be "conquered." Wheat was to be sown by "shock attack."
> "Shock troops" reclaimed the grasslands. "Victories" were won against flood and
> drought. Insects, rodents, and sparrows were "wiped out" (Shapiro 2001, pp. 3-4).

The low availability of quality data has made it difficult to conclude the damage

from China's "war against nature" between 1953 and 1976. At least 10% of China's

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[57] Scholars suggested that this tendency of Mao could be found his writing, for example "The
Foolish Old Man Who Removed the Mountains" (Economy 2010a, p. 48; Murphy 1967, p. 320).
In 1945, Mao penned this essay, which became his closing address at the Seventh National
Congress and one of the very few mandatory (and only available) materials from young students
during the Cultural Revolution. The article retold a very famous folktale that Yu Gong (literally
the "Foolish Old Man") and his sons shoveled two big mountains blocking in front of their house.
When being mocked for the futile attempt, Yu Gong replied that, his sons and descendants will
keep growing and leveling the mountains, while mountains wouldn't grow. Restless efforts will
win in the end. Thought the article was not to address any nature and environmental issue, the
analogy between traditionalism (fengjiang zhuyi) plus imperialism, which were the top enemy of
the state, to the two big "mountains" that modern Yu Gong (the CCP) should destroy, was seen to
reflect a modern Chinese "war against nature" ideology (Shapiro 2001).

forest was cut down at the beginning stage of the Great Leap Forward (Shapiro 2001, p. 82).

Marxism

Marxism is a crucial ideational force in the contemporary China. Its most common representation in the context of Chinese environmentalism is perhaps the opposition to capitalism of which the Western rival nations (especially Japan, Russia, and the United States) are the embodiment. On the other hand, in the academic realm, Marxism serves as an ideology and social theory in the form of a synthesis of philosophy, economic theory, sociology and political science. As an institutionally legitimatized ideology, Marxism has been a dominant methodology in terms of the dialectical materialist approach in scientific research and practical problem-solving attempts (Shi, 2002). However, intellectually connecting Marxism with the ecological studies did not emerge in China until the late 1980s. Ecological Marxism as a subject of study in China currently still appears to be at a bourgeoning stage where the introduction and discussion of the works by Western writers such as William Leiss, Ben Agger, James O'Connor, Joel Kovel and J. B. Foster has been the major activity in the Chinese Marxism field (Wang, 2012; Wang, Fan, Dong, Sun, & Li, 2013).

Summary

This chapter was the first part of the empirical analysis of the case of China's climate policy. It examined the material, institutional, and ideational forces shaping China's climate policy.

In the section on material force, I tried to show the important change in material conditions happened in the early 2000s. The economy went through a re-industrialization to sustain its growth rate, driving up energy needs and the risk of shortage and bringing the degrading environment in front of the national and international public eyes. In the institutional section, two important finding are about the coordinated authoritarianism and the timing of 2003 again. While the coordination argument refutes the fragmentation argument with the case of climate change decision-making, it perhaps unintendedly accentuates the authoritarian characteristic on the subject matter. Indeed, since climate change became adopted as a problem with development and national grand strategy in the 2000s (See next chapter), Chinese top leadership has noted it more seriously, which contributed to the more coordinated patterns of policy-making on the issue.

Besides, through the investigation of the Chinese institutions, it is worth noting that it was in 2003 that the principal bureaucratic actor in the central coordination committee (NCCCC) was taken again by the economic section (NDRC) in the cabinet during the organizational reform of the State Council. It was a reconfirmation of the central role of economic goals in China's climate policy thinking, formulating, and practicing.

My conclusion from the coordination-fragmentation debate leads to my next attempt to ask what the top leadership thinks of climate change and the related issues, as their ideas (or the ideas they want the others to think as theirs) would be what the policy-makers in the government have to make mutual consent on. As such, following the

discussion of the environmentalist ideas in China, I will move on to the official ideas and

discourses about development and climate change.

Chapter Six: Development and Discursive Hegemony in China

The global climate change politics has incorporated development agenda since its birth. Prior to the launch of international negotiations, developing countries demanded the first INC to be convened by the United Nations instead of WMO in 1990, as the almost purely technical discussions in the WMO settings made the developing nations beware that the scientific and technological gaps between them and the industrialized West might risk their interests (Bodansky, 2001). They made their voice heard in the making of the FCCC. In the text of the UNFCCC, "development" appeared 10 times in 4 pages, and it was stated that "[t]he Parties have a right to, and should, promote sustainable development." On the other hand, international development started to note the plausible consequences of rising sea levels and droughts as early as the 1980s. The Brundtland Report addressed climate change as one of the problems needed a new international convention to respond, and Agenda 21 included climate change in several aspects of international development projects. Google Ngram searches also show the symbiosis between climate change and development could first appear around 1983 in global narratives, and the rhetorical marriage of climate change with sustainable development (SD) emerged from 1990 (Appendix E). Sustainable development was a crucial ideational force for global climate politics.

However, as discussed in Chapter 4, the concept of SD has split, as the current mainstream version has espoused neoliberal beliefs in market centrality, state-

minimalism, and the advantage of de-politicization of development policy with a resort to technology and bureaucratiziaiton (Ferguson, 1990) as seen in the ecological modernization discourse. For the climate change regime-building, the neoliberal political economic influences not only contributed to the establishment of Kyoto Protocol but also induced its unsatisfactory results in both practical (Chapter 4) and normative terms as threatening global equity (Okereke, 2008, Chapter 6).

This discursive relationship between neoliberalism, conceptualization of (sustainable) development, and climate change politics also affects China's climate policy-making discursively. I will move on to the discussion on China.

China's Probe into Development

Chapter 4 demonstrated that the notion of "development" has evolved. What economic development means today can incorporate many things from GNP growth and eradicating poverty, institutional reforms, technological system building, to diversification of capabilities, depending on the specific issue and levels of analysis in question. In the contemporary China, the isolation from international influence prior to the 1980s compelled its leadership and people to search for their own ideas and ways to development.

When the Communist Party took over China in 1949, the economic circumstances were far more backward than those of the Soviet Union in the 1920s when it started industrialization. The newborn state had no clear development strategy but a rough idea to "steadily transform China from an agriculture-based nation to an industry-based nation, thus a great socialist nation (Mao, 1949)". Industrialization would be the sole idea

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to suffice development.[58] Besides, the leadership's main focus at this point was the immediate need for postwar recovery; industrialization was not yet seen as urgent. During this time, the economy had a mixed-ownership system, in which the state possessed most part of the industrial sector, but smaller private sector sustained and even prospered compared to the pre-revolution era.[59]

With the outbreak of the Korean War in 1950 and China's soon participation, Chinese leaders began fast, large-scaled resource mobilization for fighting the war. Industrialization became needed. When China requested for assistance from the Soviet Union for this purpose, leaders chose to adopt the Soviet Union model—mass heavy industrialization through collectivization of agricultural sector with the totalized state command.[60] Therefore, starting from 1952, nationalizing ownership and agricultural collectivization set forth the ways of mobilizing resource and labor, and by 1956 these projects were basically completed. Development at this time would be defined and determined by outputs of grain and steel. Features of the Chinese economic system from the 1950s to the 1970s were: state ownership of the means of production in the cities; collective ownership of the means of production in the countryside; and centralized planning with targets and quotas for physical outputs and employments (Li, 2008, pp. 27–

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[58] Mao Zedong and his colleagues at this time might not have acquired the vocabulary of "economic development" as another term "economy-building (*jingji jianshe*)" was more often seen. But "development" (*fazhan*) had certainly appeared.

[59] In 1953, the private sector still accounted for 37% of China's industrial output (Li, 2008, p. 27).

[60] When China drafted its first Five-Year Plan in 1952, building heavy-industry sector was included in the text as the first priority. The Chinese envoy soon brought the draft to Moscow for consultation and financial assistance.

28). In terms of development thinking, the dominant ideology was a nationalist and developmentalist paradigm: extracting maximum surplus from the society with state power to win China's international status. Rapid heavy industrialization was the set goal, despite that the initial levels for primitive accumulation were low. Over-extraction, collective fervor, misinformation, and failed governance system as happening during the Great Leap Forward eventually induced disastrous outcomes including a great famine. It was said more than 45 million Chinese people died unnecessarily between 1958 and 1962 (Dikötter, 2010).

Mao's death in 1976 marked the decline of the leftist economic agenda in China. In 1975, Premier Zhou Enlai enunciated the Four Modernizations (agriculture, industry, science and technology, and military) to revitalize China's economy and society. With attainment of the Four Modernizations as their overarching objective, Deng Xiaoping and his supporters initiated a wholesale reform of the country's economic and political system. In the early 1980s, China began to gradually relax the formerly tight state control; this signaled the beginning of a transition from a state-directed, command economy to a more market-based economy. Beijing devolved significant economic authority to provincial and local officials, removing political constraints on their economic activities and diminishing Beijing's own ability to influence the development and outcome of these activities. China also began to invite participation from the international community in China's economic development through foreign direct investment and trade (Naughton, 2007, Chapter 4).

The 1992, during his trip to the southern China, Deng explicitly called for transformation in the direction of the "socialist market economy," which was officially confirmed by the Fourteenth Congress of the Chinese Communist Party. The Congress then, for the first time, made the commitment to "property rights reform," thus legitimizing the privatization of state and collective-owned enterprises. As such, China experienced its second and deeper capitalist economic transformation throughout the 1990s. Most of the state and collective-owned enterprises, which had been the foundation of the urban economy, were privatized. Private and cooperative ventures were encouraged to expand, smaller-scale township and village enterprises were encouraged to launch to energize the rural economy.

However, as Li (2008) critiques, the capitalist turn in China was just another triumph of the global neoliberal project in the 1980s and 1990s. The privatization of agricultural production and state/collective-owned enterprises had removed the previous socialist entitlements for workers (ensured employment, healthcare, housing, etc.), and caused tens of millions of workers to be laid off. Hundreds of millions peasants had been forced into the cities where they became "migrant workers," constituting an enormous cheap labor force that would work to serve the profits of transnational corporations and Chinese capitalists for the lowest possible wages under the most demeaning conditions.

To sum up, the development thinking for China before the neoliberal/capitalist paradigmatic shift did not share resemblance with the evolution of the global development discourses. But since the 1990s, China has been receiving and reacting to

the global discursive hegemony of a neoliberal mode of development—the sustainable type included.

China's Sustainable Development (SD) Discourse

The mainstream SD discourse was brought to the attention of Chinese leaders in the early 1990s. The Chinese government officially adopted an SD discourse in 1994 its *Agenda 21* in July 1994, after its participation in the Rio Conference in 1992. The term did not appear again in high-level official statements again until September 1995 when the government was about to announce the Ninth Five-Year Plan. Neither did it appear in Premier Li's address delivered at the UN Summit on Social Development in March of that year, where sustainable development was the theme of the summit as well as the resulting declaration endorsed by world leaders.

What China's *Agenda 21* presented was a vision for the future Chinese economic and social development rather than concrete policy planning. It outlined an array of programme areas and framed sustainable development as a high-level grand strategy for "a good starting point for China as it moves towards the 21st century and strives for a better future (GoPRC, 1994)," but did not (and maybe yet could not) specify how the listed aims in those programme areas could be practically approached.

The *Ninth Five-Year Plan and the Prospects for 2010*, published in 1996, marked the beginning of the SD discourse getting mainstreamed into official consideration and integration into real policy planning of economic and social development. For the first time, topics that used to be separately categorized and/or very little mentioned—natural resource management, pollution regulation, rural housing and sanitation, and,

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intriguingly, mass physical education and media production—were put under the section

heading of "Implementing Sustainable Development (GoPRC, 1996)," making SD appear

to be a "fundamental development strategy" of the country ever since (CAS , 2012, p. 5).

At the Fifteenth National Party Congress (NPC) in 1997, President Jiang Zemin included

SD in his keynote speech—in the politics of rhetoric in China, it is the highest official

approval of a political idea.

However, the Chinese SD narratives during the 1990s appear to be more close to

a mimicking or window-dressing act as a gesture of China's convergence with the rest of

the world. The 1992 Rio Conference was not only an UN meeting on environmental

issues for China, it was seen as an opportunity for China to re-blend into international

relations after the isolation and embargos due to the Tiananmen Massacre in 1989.

Besides, "development (*fazhan*)" has become a buzzword in Chinese political rhetoric

since Deng's reform. In the NPC keynote speeches, "development" was mentioned 32

times in 1982, 125 times in 1986, 113 times in 1992, and 152 times in 1996.[61] As the

leaders cared improvements of economic and social conditions, it was not surprising that

they could accept the notion of SD quickly after the 1992 Rio Conference.

As to the content of the Chinese SD narratives, in the 1990s there were two

characteristics. First one is the strict emphasis on conservation and population control,

framing population as the most important reason for environmental degradation. Second

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[61] Only those mentions of "*fazhan*" used in the contexts of economic, social, and sometimes cultural matters including the past achievement, planning and encouragement/prospects were counted.

one is the linkage of SD with science and education. These two features will reemerge in the more recent discursive practices of the Chinese government.

A Sustainable Development "with Chinese Characteristics" and Views on Climate Change

The beginning of the 21th century saw an important change for China in material terms, namely it rapid re-industrialization along with the entry into the WTO, which have made it the world's factory and the second largest economy. The re-industrialization had three immediate drivers. Firstly, after almost two decades of primitive accumulation of capital, the surplus capital now would need somewhere to go. Secondly, the economy would welcome a new thrust to re-accelerate growth, which had been slowing down since the second half of the 1990s. Thirdly, in 2001, the International Olympic Committee announced Beijing would host the 2008 Olympic Games. As a result, in addition to investment from the private sector, the government also launched mega development projects such as the South-North Water Transfer and the Great Development of Western China, both had been under planning for a long time and were put into action within the first three years of the 2000 decade. These economic and development activities and the uprising world economy contributed to China's industrialization in the first half of the 2000s, generating an averaged 10% growth rate for another decade, as well as enormous amount of energy use and GHG emissions.

Institutionally, China saw a major change at this point of history. In 2002, when the succession of political power within the Chinese Communist Party took place smoothly for the first time in more than 50 years of the party-state history, the new

government led by Hu Jintao and Wen Jiabao turned to underscore more seriously the environmental aspect of development in coping with growing crises mentioned above. The official tone has been raised on problems of energy and resource shortages and pollution outbreaks compared to the 1990s. The topic of resource and environment in the text of the 9th Five Year Plan in 1996 was listed in Section 9, but it was promoted Section 4 in the 10th FYP in 2001, accompanied with a few more quantified targets on resource management. Trivial as it is, this slight change in the words of official documents may have reflected a changing paradigm on the environmental issue in the Chinese government. Important new laws focusing on environmental aspect in the course of developing the economy were passed, such as the Law on the Promotion of Clean Production and the Law on Environment Impact Assessment. However, within the governmental bureaucracy, the NDRC has been charged with the greatest power in the fields of economy, energy and climate change (Heggelund et al., 2010, pp. 237–8).

Ideationally, the discourse of vulnerability was introduced to domestic policy context. On the discourse of development, a series of policy ideas mushroomed in the course of China's changing development model: "the New Path to Industrialization (2002)," "the Science-based Development (2003)," "Circular Economy (2004)" "Resource-saving and Environment-friendly society (2004)" "Harmonious Society (2005)," "Conserve (Energy) and Cut (Emissions) (2006)" "Innovative State (2006)," "Ecological Civilization (2007)" "Green/Low-carbon Economy (2009)," "Change of the Growth Model (2010)" and "Green Low-carbon development (2011)," to name a few. These ideas were typically products of official and non-governmental and societal actors.

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They were generated and refined by government-sponsored research institutes at universities, think tanks, and NGOs before they become part of the official rhetoric; they have added to a more localized Chinese version of SD discourse.

Among them, "Science-based Development" (SBD) and "Ecological Civilization" are the most interesting because they both speak to a context broader than just the "hardware" improvement in economic growth and social conditions as many of the other ideas did. They both try to draw a picture of the future in which China lies, providing "software" to the building of vision and hope. Here I will focus on the SBD as it is the first substantive concept Chinese government raised in the 21st century and the first one directly addressing development a decade after the *Agenda 21*.

President Hu Jintao proposed the SBD in 2003 and presented at several highly political venues including the Seventeenth National Party Congress. During his trip to Jiangxi Province in 2003, Hu gave a long and expansive explanation of his new idea:

> It is necessary to solidly adopt the scientific development concept of coordinated development, all-round development, and sustainable development, [and to] actively explore a new development path that conforms to reality, further improves the socialist market economic structure, combines intensified efforts to readjust structure with the promotion of rural development, combines efforts to bring into play the role of science and technology with efforts to bring into play the advantages of human resources, combines the development of the economy with the protection of resources and the environment, combines opening up to the outside world with opening up to other parts of the country, and strives to take a civilized development path characterized by the development of production, a well-off life, and a good ecological environment (Fewsmith, 2004, p. 2).

It is a model that seemed attempting to contain every problem China was facing then. But rural development, regional gaps, science and technology, and ecology are the main points. A month after the Jianxi trip, the Third Plenary Session of the 16th Central Committee endorsed Hu's concerns though not the term itself. But the plenum decision

did align with the new president and say that it was necessary to "take people as the main thing (*yiren weiben*), establish a concept of comprehensive, coordinated, sustainable development, and promote comprehensive economic, social, and human development." This sentence has since been invoked by Chinese media as the locus classicus of the idea of SBD (Fewsmith, 2004, p. 3).

So, what is a "comprehensive, coordinated, and sustainable development? Practically, the most noticeable in the SBD narrative is that it promoted an approach aiming to correct the presumed overemphasis on the pursuit of increases in GDP, which has encouraged false figures and dubious construction projects along with neglect for the social welfare of those left behind in the hinterland. Researchers and writers from the Publicity Department of CCP elaborated the reflection on the former GDP-ism:

> Single-minded pursuit of economic growth while overlooking social progress and fairness and neglecting environmental protection and energy and resource conservation in some countries has resulted in unbalanced economic structure, poor social development, growing shortages of energy and resources, and drastic ecological and environmental degradation, as well as greater division between haves and have-nots, increased unemployment, corruption and political unrest, and other problems that can arise with a high growth rate. In these countries, economic growth did not bring tangible benefits to the people, the growth was not sustainable and development was not true development. The development practice of the world has shown that development is certainly more than just economic growth. Development should mean comprehensive economic, political, cultural and social development, and development should be sustainable and maintain harmony between man and nature (CCTB, 2012, p. 5).

Conceptually, SBD can be seen as a localization of the mainstream global SD because it infused traditional Confucian, Taoist and Maoist-Marxist references into the reframing of a development model, and made itself to become the theoretical reference and the source of political authority for the other above-mentioned ideas that came in later times. To be sure, this model is not entirely new. But its innovation rested in the

acceptance of the nature's limits on GDP growth and the justification of this acceptance

through a linguistic practice using the indigenous language, and has made itself

distinguishable from the previous SD discourse in China and has been able to play a role

in policy-thinking and policy-making. Below I explicate what SBD as an action-guiding

concept means with three generalizations in the context of the evolution of energy policy.

Economic Primacy

When SD first as a global hegemonic discourse was first received by Chinese, it

had been translated and equated to "sustained development, "[62] narrowly referring to

continued economic growth as the foundation for the other aspects of social progress. The

primacy of continued economic growth, for example, was expressed clearly in the text of

China's Agenda 21:

> "[T]he precondition for sustainable development is development. The path of
> relatively rapid economic growth and gradual improvements in the quality of
> development must be taken in order to meet the Chinese people's current and
> future needs for basic necessities and their desires for higher living standards, and
> in order to consolidate the nation's strength. Only when the economic growth rate
> reaches and is sustained at a certain level, can poverty be eradicated, people's
> livelihoods improved and the necessary forces and conditions for supporting
> sustainable development be provided. While the economy is undergoing rapid
> development, it will be necessary to ensure rational utilization of natural resources
> and protection of the environment. And while it is necessary for China to embark
> on a gradual path to sustainable development, it must do this at the same time as it
> is improving economic conditions and structures, enhancing their effectiveness
> and maintaining an annual average GNP growth rate of between 8 and 9%."
> (GoPRC 1994)

Here, development is framed as the mission to reduce poverty and supply for

people's livelihood. Economic growth is believed to have to be "ensured" as the

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[62] Interview, Peking University, December 10, 2012

"precondition" to allow development to happen. Although the tone has been softer the importance of GDP growth has been downplayed, and common claim can be found in the SBD discourse, which has insisted that the "middle-income society" is the foremost pursuit of development.

Ecological viability

The concerns for the environmental degradation and protection started back in the early 1970s, in which negative environmental consequences from the movement of Great Leap Forward surface to public attention. In1972, the beach at Dalian Bay became black from polluted shells and the port became clogged, and tainted fish appeared on the Beijing market from the Guanting Reservoir (Economy 2010). Another event that sparked the official awareness of the environment was the Conference on Human Environment was held in Stockholm, Sweden, which was viewed by the leaders a chance to enter the international society after the long isolation during the Cultural Revolution (Yan & Xiao 2010). Therefore, the Chinese environmental policy was rather instrumental and auxiliary in terms of being made to serve the purposes of other issues in the early years.

One reason for this status of environmental policy may be traced back to the revolutionary discourse treating nature as an enemy to be transformed. Mao Zedong's favorite Chinese idiom, literally translated as "human determination must conquer the sky," became a motto for the mass during the Great Leap Forward, turning a pursuit of economic prosperity into a "war against nature" (Shapiro 2001). In this discourse, economy and environment were treated as mutually exclusive and conflicting values. As

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the majority of Chinese population was still trapped in poverty, caring for the environment could be only a luxury that Chinese people couldn't yet afford. "Pollute first, clean up later" was the leading principle for especially local officials in dealing with the economy-environment nexus until the 1990s.

In this context, the mainstream SD discourse presented an alternative to this antagonistic framework of the economy-environment dilemma. For what was interpreted in the Chinese context was that economic development (i.e. increase GDP growth) does not necessarily sacrifice the quality of life in the environmental aspect. So, if the leadership could choose a right model of development, filthy air, heavy-metal water and hazardous soil would be corrected without harming the economic growth on which the improvement of material living conditions depends. This view was later further combined with the ancient idea of "Harmony (between the nature and humankind as in Taoism; between each person and the groups as in Confucianism)" and transformed into the SBD discourse.

However, the SBD discourse does not place the priority of the nature over man. The nature-human relationship is similar to the kind depicted in Confucian and Legalist literature (Ch.5). A "people-centered" approach in the SBD discourse suggests that development, under which environmental and economic values are seen incorporated and in harmony, is the right kind of development and has to serve people's needs. Environmental issues, therefore, still have to be considered against economic viability. For example, unlike its predictions for control of ozone-depleting substances, China's Agenda 21 was pessimistic about the chances of controlling greenhouse gas emissions.

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At the outset, it had noted that, in view of China's substantial coal resources and its developmental level, a coal-based energy structure would continue well into the future.

Social engineering of "going green"

The social dimension of the mainstream SD discourse usually addresses the poverty and equity concerns in the course of economic development. In some literature, including the Bruntland report, the sustainability of an economy's development requires democratic practices and public participation.

In the Chinese context, the element of equity is underscored in the SBD rhetoric in different ways, while public participation is supposed to be limited to enhancing the public awareness of environmental protection by media and education. In recent years, many public educational campaigns have been launched to propagate those "green" ideas and policies mentioned earlier in this section. In the meantime, the enforcement of green polices could be rapid and forceful. Compulsory shutdowns of factories in some places and lax regulations in the other places both incurred public discontent and unrest that could be understood as "destabilizing" and created more power to the "stability-maintenance" system pressuring the society.

State-owned newspaper is an important means of the Chinese government for circulating authoritative opinions, defending government's policy actions and thus reproducing its authoritativeness. Whether or not this tool is effective in terms of producing social conformity, the contents in those newspapers embody the official power's hegemonic discourses and its attempt to build hegemony over the society.

A Text Analysis on Climate Change

The People's Daily (*Renmin Ri Bao*), one of the most historical state-owned newspapers in China, began to report on climate change from as early as 1960s, but those early articles did not discuss climate change in the current sense, rather the term was used to refer to the changing weather patterns and natural disasters. Therefore, 418 reports on climate change or global warming were collected from the People's Daily dated from 1990 to 2012 to see how the articulation of climate change and other related ideas had changed. In this corpus, as Table 6-1 shows, climate change is the most related to "global" and "development" linguistically.[63] The term "development" did not appear for the first time until 2000, and had been mentioned steadily since then. If the original data were complete and my methods of compilation were reasonable, this finding should support the argument that a new linkage between climate change and development indeed was generated, which was the precondition for views on development to affect the views on climate change, and by extension, for the development policy to possibly affect the climate policy.

It is interesting that, while "environment" is ranked lower than "development" in Table 6-1, as opposed to the latter, the former in fact appeared in the climate change coverage of the People's Daily through the 1990s. In the 2000s, "development" apparently took over "environment" as the most popular buzzword when it came to the topic of climate change. But a co-occurrence analysis also indicated that almost one

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[63] The data was collected based on two keywords as "climate change" and "global warming", so "climate" cannot be the most related term.

quarter of the discussions on development also addressed environmental concerns,

reflecting the development-environment nexus in the reality of China's attitude on the

global climate problem.

Table 6-1 Top 50 Frequent Words in People's Daily Reports on Climate Change (1989-2012)

Rank	Word		Length	Count	Percent[64]
1	氣候	climate	2	2674	12.609639
2	全球	global	2	1939	9.143639
3	發展	development	2	1795	8.464585
4	國家	state	2	1767	8.332547
5	變化	change	2	1528	7.205508
6	中國	China	2	1394	6.573611
7	變暖	warming	2	1239	5.842686
8	環境	environment	2	1167	5.503159
9	問題	problem	2	1109	5.229652
10	經濟	economy	2	1067	5.031595
11	國際	international	2	986	4.649627
12	世界	world	2	961	4.531736
13	地區	area	2	906	4.272376
14	美國	United States	2	862	4.064887
15	人類	human	2	666	3.140621
16	影響	impact	2	649	3.060455
17	社會	society	2	644	3.036876
18	溫室	greenhouse	2	643	3.032161
19	排放	emissions	2	614	2.895407
20	政府	government	2	612	2.885976
21	能源	energy	2	608	2.867113
22	氣體	gases	2	599	2.824672
23	研究	research	2	564	2.659625
25	天氣	weather	2	508	2.395548
26	生態	ecology/ecological	2	505	2.381401
27	保護	protection	2	473	2.230501

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[64] The percentage is calculated by dividing the frequency of the given word ("Count" in the 3rd column) with the number of the total word count in the corpus.

28	技術　technology	2	469	2.211638
29	減少　reduction	2	463	2.183344
30	聯合國 United Nations	3	461	2.173913
31	資源　resource	2	455	2.145619
32	會議　meeting	2	443	2.089031
33	科學　science	2	442	2.084316
34	持續　sustain	2	430	2.027728
35	地球　earth	2	427	2.013581
36	氣溫　temperature	2	412	1.942846
37	發達　developed	2	389	1.834386
38	建設　construction	2	384	1.810808
39	合作　cooperation	2	381	1.796661
40	減排　emissions reduction	2	359	1.692917
41	極端　extreme	2	330	1.556163
42	災害　disaster	2	324	1.527869
43	科學家 scientists	3	322	1.518438
44	自然　nature	2	322	1.518438
45	企業　businesses	2	309	1.457135
46	氣象　meteorology	2	306	1.442988
47	嚴重　severe	2	300	1.414694
48	冰川　glacier	2	296	1.395831
49	水　　water	1	294	1.3864
50	非洲　Africa	2	288	1.358106

Table 6-1 also reveals that economy and foreign relations are the primary rationales in the climate change hegemonic discourse the Chinese authority wished to construct. Words connoting the economic concerns (e.g. development, economy, and energy) and foreign relations (e.g. global, international, world, United States) are ranked in the top half of the list; whereas words with meanings related to the environment (e.g. ecology, earth, disaster, nature, glacier, water) are mostly in the bottom half.

Chinese Energy Policy under SBD

Prior to the reform, China's energy industry was highly dependent on the capital, financial and technical assistances from the Soviet Union between 1949 and 1960, and these inputs were mainly for fostering heavy industries. From 1960 to the dawn of the reform in the late 1970s, isolation and the Oil Crisis in 1972 strengthened the doctrine of self-sufficiency in the economic policy also dominated the energy development.

Chinese leaders have paid growing attention to the symbiosis between energy and economic development since then. Deng Xiaoping's remark that "energy is the most important issue in our economy" in 1980 was said to found the strategic energy planning in China. In the same year, the book *The Third Wave* by Alvin Toeffler was translated and published, and became the bestseller particularly among academics and government officials.[65] The book influenced the energy thinking of the Chinese policy elites with the introduction to and discussions on alternative energy sources as the basis for the upcoming "third wave" of the human civilization.

To serve the need of producing growth, the government started to expand the production of energy from the inception of the Ninth Five-Year Plan (1995-1999). In retrospect, since the Economic Reform in 1978 until the end of the Eighth FYP in 1995, the central government had encouraged small-scaled energy production by the local governments, largely elevating the country's overall capability for energy production. One reason for this was to buffer the world energy crisis at the beginning of the reform, and the other reason was sort of due to ideological impact that sovereignty and self-

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[65] Interview, RCSD, Chinese Academy of Social Sciences, October 22, 2012.

subsistence as principles in Chinese foreign policy also dominated economic policy. And then, from 1996-2000, the focus of economic planning shifted from light industries to an upgrade for manufacturing machinery parts and more capital-intensive products, further bringing up the demand and production capacity for domestic energy. The next stage was the first decade of the twenty-first century, which saw a sharp increase of energy use. Heavy industries including steel, cement, petrochemical, were launched with the state's strong investment and institutional support, driving up the energy demand faster than the domestic energy sector's ability to cope with and causing an energy shortage.

The early 2000s was also significant in that SBD discourse was granted the highest political and ideological authority starting from 2003 and became the doctrine of the Eleventh Five-Year Plan (2006-2010). While the entire energy sector continued expanding, what marks these five years was the forced closure of thousands of old, small and inefficient coal-fired power plants were in the name of emissions reduction and achieving a sustainable development.

The most significant change in China's energy policy in this period was the quantified energy targets that were set compulsory in the Five-Year Plans. Before launching its Eleventh Five-Year Plan, China for the first time announced quantitative goals on energy and pollution problems. In the Guidelines for the Eleventh Five-Year Plan issued by the State Council in 2005, China aimed to drive down the national energy intensity for 20% and the emissions of primary pollutants for 10% by 2010.

In 2009, China pledged a 40-45% cut on its carbon emissions per unit of GDP on 2005-level by 2020 prior to the UN climate negotiations in Copenhagen, on which it

made further pledges for the period between 2010 and 2015, that it would cut down its energy intensity, carbon-emissions intensity, and emissions of primary pollutants for 16, 17 and 10 percent, respectively. The NDRC had concluded that the Eleventh Five-Year Plan had successfully achieved the 20% goal.

As for the Twelfth Five-Year Plan, the government has also set up several important targets concerning energy development by the end of 2015. First, energy use per unit of GDP should reduce by 16% on 2010 levels. Second, the total energy consumption is capped at 4 billion tons of coal equivalent (tce). Third, non-fossil energy sources including hydro, nuclear, and renewable energy are aimed to increase from 8.3% to 11.4% of total primary energy consumption. While the current 16% reduction target on energy intensity may seem less ambitious than the previous 20% goal, it likely presents a more substantial challenge, for the largest and most inefficient enterprises and plants have been shut down or have undertaken improvements. There is much less room for improvement as to the ongoing second round of restructuring.

Economic Primacy

China's current energy strategy based on SBD represents the insistence on economic primacy. This may be seen in the policies on emissions reduction. The involved programs all emphasize economic efficiency in terms of conserving energy use while minimizing negative impact on the existing levels of GDP growth. One of the often-mentioned policies for getting there was the Top 1,000 Program, starting in April 2006 under the execution of the NDRC leading other governmental units. The program assigned energy-saving targets to 1,008 enterprises in energy-intensive industries such as

steel, coal, petrochemical, electricity production, and implemented monitoring, auditing, reporting, rewarding and punishing mechanisms. Another policy was the Ten Key Projects Program, which has provided financial support to companies to adopt or upgrade more energy-efficient equipment. In the post-2011 period, a new Top 10,000 program is modeled after the Top 1,000 Program, but it adds an order of magnitude of companies to the mix. Another mitigation program centering on economy efficiency is the cap-and-trade market. In 2011, the NDRC announced and appointed seven pilot cap-and-trade programs for carbon dioxide. Currently, Shenzhen, Guangdong, Beijing and Shanghai markets are operative, whereas Hubei, Tianjin, and Chongqing are scheduled to launch by 2015. The commonality between the idea of market environmentalism and SBD is clearly seen.

Ecological Viability

In 2005, the outline for Eleventh Five-Year Plan called for changing the economic growth pattern by adjusting economic structure and energy mix when announcing the official goal of driving down energy use per unit of GDP for 20% from 2005 to 2010. In this document and the following policy articulation describing the ideal development model, the key phrase changed from what used to be "fast and sound" to "sound and fast" development. Switching the order of words was believed to signify a shift in policy orientation.[66] By putting the quality of soundness ahead of fastness, the importance of environment was accentuated and the weighing between the economy and the environment seemed to be switched.

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[66] Interview, RCSD, Chinese Academy of Social Sciences, Oct. 12, 2012.

This evaluation is both right and wrong. Take the non-fossil fuel energy policy for example. In retrospect, China indeed saw the environmental benefits of renewable energy sources, but its primary aim has been to fulfill what the SD and SBD discourses portrayed: a continued growth without sacrificing a livable environment.

The passage and effectuation of the Renewable Energy Law in 2006 kick-started the Chinese enterprise in seeking renewable sources as its new energy strategy and an exit for the burden of mitigating climate change. Investments to clean coal technologies, carbon capture and sequestration, and smart grid have been on constant big rise every year. In 2009, President Hu Jintao announced China was aiming to promote the use of renewable energy source to 15% in its overall energy consumption by 2020. This promise indeed followed the fact that China's deployment in solar and wind power has roared since 2007. In 2009 alone it invested more than 30% of the total amount invested by all G20 countries, becoming the world's largest investor in renewable installment (Pew, 2010). And in 2010 the amount it invested was $50 billion, far more than that of any other country in the world, not only for deployment but also for manufacturing renewable energy technologies. Hydropower and nuclear power are also treated as critical energy options. The share of hydropower in total energy consumption in 2011 was 6%. It is said the Chinese thirst for hydro energy and its urgency to meet the 15% target by 2020 may endanger the hydrology of south and southeast Asia by damming its southwestern region (Jacobs, 2013), but it seems the government is convinced that technological capabilities can overcome the risks. The quest for a "cleaner" source of energy despite the ecological impact perhaps presents the greatest split between the Chinese SBD and the conventional

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idea of environmental sustainability. But the SBD presumes the Confucian-Legalist beliefs in human capacity to alter and remain harmony with nature (as man and nature are never supposed to be opposite and conflicting entities), and the socialist notion of intra-generational equality. So from the Chinese perspective, the choice for dams over ecological soundness may not be contradictory to SBD; somehow SBD can justify this position as if utilizing the gift from heaven with collective persistent efforts and expertise is worth glorifying.

Social Green-Engineering

Local governments along with private companies and factories, were also required to work toward energy efficiency. In order to do so, the collective target of central government to cut energy intensity by 20% was dissembled into local levels, and each province and province-level city was assigned its own target ranging from 12-30%. Consequently, many inefficient power and industrial plants were targeted for closure. The government "decommissioned small thermal power plants with a capacity of 72.1 million kW and eliminated a number of outdated coal, steel, cement and coke production facilities" between 2006 and 2010 (Wen, 2011)(Wen 2011). What happened later between July 2009 and March 2011, the last several months of the 11th Five-Year Plan period, was that many local governments switched off power supply in order to lower their electricity readings to meet their assigned targets. In provinces like Zhejiang, Jiangsu, Hebei, and Shanxi, electricity was shut down, sometimes lasting more than 20 hours in one occurrence, in not only factories and houses but also hospitals and schools and even in bitter winter. Moreover, people turned to small electric generators that run on diesel,

which would produce more GHGs and more serious air pollution that was unable to be traced and accounted for. Two interviewed researchers from the Center for Sustainable Development at the Chinese Academy of Social Sciences confirmed that the closure has resulted in great economic and social costs. "Many workers lost their jobs! They have family and children…Efficiency is important, but we should also take equity seriously," said one of the interviewees.[67]

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[67] Interview, RCSD, Chinese Academy of Social Sciences, October 22, 2012.

Chapter Seven: Conclusion

Looking Ahead

On June 30, 2015, China submitted its Intended Nationally Determined Contributions (INDCs) to the FCCC as its proposal for the COP-21 in Paris, after a widely-reported joint statement on responding to climate change with the United States a few months ago in January. The Paris Climate Convention, scheduled to be in December 2015, is aimed to create a more enforceable and effective global climate regime than the Kyoto Protocol. "Enforceability" means the measuring, reporting, and verifying mechanisms, and "effectiveness" means to include the majority of global GHG emitters, including the United States, China and other large emerging economies in order for a truly global mitigation effort. China's pledges this time contain halting growth of carbon emissions and the use of renewable energy sources (Buckley, 2015).

The Chinese government had promised in 2009 to cut its carbon emissions per unit of GDP by 40 to 45% from its 2005 level, and to do so by 2020. Premier Li Keqiang announced a new goal in June this year, to extend the cut to 60 to 65% by 2030. It was analyzed that China had already fulfilled much of its original commitment. By late 2014, according to government data, carbon intensity was down by 33.8% from the 2005 level. Other proposed targets in the submission include the promise to peak greenhouse gas emissions by 2030, which was first announced in 2014. Li also reiterated that renewables

should make up 20% of China's primary energy supply (China Dialogue, 2015). With the

effectuation of the revised Environmental Protection Law, China has introduced new and

toughly-enforced regulations and penalties to hasten changes to how energy, raw

materials and goods are produced and consumed in the country. Although many technical

issues over how the proposed goals can be realized have arisen, it is no doubt that how

much and how quickly China's emissions can be reduced plays a crucial role in the

management of global climate change, and the actions of Chinese government will very

likely stir political debates among policymakers in Washington, creating impact that

bears great significance on the history of global climate governance. For years,

international negotiations have brought little agreement on how to assign responsibility

for cutting greenhouse gas pollution. Many have hoped, even expected that Paris will be

very different from the Copenhagen in 2009 that substantive cooperation can happen

between wealthy and developing economies, especially between the United States and

China. Understanding what drives China's policy positions thus has been essential

empirically and practically.

Summary of Findings and Arguments

In answering the empirical questions on why and how China changed its position

on climate change, the study has examined them with a discursive hegemony framework,

and come to a few findings summarized below.

Firstly, the issue of climate change is now merged with the development policy

for the Chinese government. Although China has insisted on its status as a developing

country at climate negotiations, the policy linkages between climate mitigation and economic and energy policies took place only recently.

Secondly, it was the co-evolution of several changing conditions that together shaped the outcome of the policy shift. Three types of "social forces" in material, institutional, and ideational forms embodied in a conglomerate of events took place in the first several years of the 21st century, causing the development agenda to absorb the climate issue with the operation of a set of policy narratives based on the official idea of Science-based Development.

As a third finding, energy shortage and the growing cost of environmental degradation were perceived to be most acute problems in the material aspect. The expanded energy demand reflected on the increased energy intensity during the first few years in the 2000s, the increasing reliance on foreign oil, and the constraints on using domestic coal together constitute the problem of energy shortage for the Chinese government. While the international pressure on emissions reductions and internal struggles over reforming state-owned enterprises (targeting some of the largest oil and energy companies) are present, shortage is the most salient propelling force to China's rethinking of its development, energy, and the extended environment and climate policy.

Institutionally, the consolidation of power-transition rules within the party and government seemed to have reduced the political uncertainty within the party so that the government could be more concentrated on national development issues. The elevation of climate issue to the centrally-coordinating level in 1998 and the following stepping-up to the highest-executive level in 2007 represented at least one important point. The

leadership came to perceive that the climate issue has becoming an issue beyond diplomacy and international politics. The complexity of the problem has gotten noted in many dimensions particularly those under the agenda of development. An integral framework thus was needed.

Fourthly, what development means changed in the process as seen in the changing emphases in the official narratives. Within the agenda of development, the old perception on energy-growth relationship and growth-environment relationship was reconstructed. Although energy security is still believed to be the foundation of necessary amount of economic growth, the government has noticed that the sourcing of energy matters, as using "dirty" energy may cause large human and social hazards impairing economic growth. The Chinese SBD narratives consist of conceptual elements of economic primacy, ecological viability, and social engineering. The notions distinguishing single-minded growth and quality growth, urging fairness and environmental protection are notable changes from the previous development discourses. Reformist ideas of the global sustainable development discourses, such as market environmentalism and ecological modernization, are the pillars of SBD as it still puts the building of economy at the center of China's development scheme and it is believed that the process must rely on science and technocracy. Although many ideas in the SBD narratives were not entirely new nor original in contrast to previous official narratives, the way in which the ideas were articulated was different, and the extent to which the environmental-awareness was upheld was greater.

As such, the most important empirical finding for this dissertation would be the co-evolving process of three ontologically independent forces. Their co-occurrence brought the rethinking of development models, thereby accepting that taking actions on climate change could be compatible with new development goals. The SBD discourse helped justified climate-related policies, such as energy conservation and emissions reduction, as economically rational and socially harmonious, thus normatively imperative.

The discursive hegemony perspective developed in this research was helpful in process-tracing and organizing the causes of change in this case of China. The Chinese government, which was assumed to be an actor that is internationally socialized and internally homogenized (through the coordination decision-making practices), received the global SD discourse in the midst of the prosperous wave of neoliberalism during its course toward the second (1990s) and third waves (2000s) of industrialization and development. Material and institutional forces evolved with the SD ideas together created the discursive framework as the SBD to re-rank priorities, facilitate policy designs, and justify policy practices.

A comment from one Chinese senior researcher on development and climate economics can summarize China's position on climate change in light of the analysis above:

> Before the Kyoto Protocol came into effect, climate change served as matter of diplomacy to China. But today it is no longer simply seen as merely a diplomatic matter. There are still many gaps between the rich and the developing countries in scientific research and ways of allocating responsibilities. But to China, the government had realized the potential value of taking climate change seriously when the IPCC published the third assessment report in 2001. Academics were

backed by the authorities to step up their participation in the production of the fourth Assessment Report...Rapid economic growth has occurred since 2001, which means resources and environmental issues have become more acute and perceptible by the public. Reducing power use and controlling greenhouse gases have become primary strategic goals in the 11th Five Year Plan and at the 17th National Congress of the Communist Party. Reducing energy use is still given priority because it has been considered as the one stone that can kill two birds, because it can be used to bring domestic development goals in balancing growth and environmental quality; and international climate-change foreign policy into line.[68]

Finally, through the investigation with a discursive hegemony framework, this study has found that the "turning point" of Chinese climate policy can be traced back to as early as 2003, in which a series of changes of material, institutional, and ideological forces happened. This is a different from many existing literature which assumes China's change of climate policy started from 2007.

Contributions

The contribution of this research is twofold. First, this study tried to answer the highly interesting question regarding "change" with a causally-deeper theoretical approach (Khan, 2008). The approach of discursive hegemony helped me investigate the question from several different perspectives and defined the relationship between analytical levels. To the best of my knowledge, while connecting discourse analysis, development and climate change has been seen in the literature, same type of research specifically focusing on the case of China is yet available. I think the present piece can contribute to the field of climate and environmental empirical studies by filling this void.

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[68] Interview, Chinese Academy of Social Sciences, November 14, 2012

Second, theoretically, my initial scheme included to build a cross-level analytical framework that can capture the interactive movement of the global discursive hegemony and a national one. In my original contrivance, the dominant mainstream SD discourse with the ideas of market environmentalism and ecological modernization have impacted the Chinese construction of SBD in aspects of the three axes suggested by Hajer and Versteeg (2005) which are the institutional centralization around governmental agencies, the emergence of new instrumental knowledge, and the diffusion of power effects over society as a whole. I found I would need a substantial amount of additional knowledge on domestic interactions, particularly the specific policies and economic operations at the city or even township levels to construct possibly meaningful analysis, and more ideally another country case(s) for comparative studies. It would be a much bigger project than the scope of this dissertation and beyond my current capacity, but I would like to carry it on for possible future topics of study.

Limitations and Future Research

One central problem with the discursive hegemony framework at the theoretical level is that actors are not defined *a priori* as they have to be revealed through tracing discourse. Agency is therefore unsure before the research embarks. Empirically, when the structure under study is assumed hegemonic, it would be difficult to find out "who's talking" as the dominant discourses are pervasive and there is no significant variation for a researcher to detect the discursive "rupture" (Derrida, 1993) in the structure. Simply put, the researcher can be buried in overwhelmingly monotonous signaling that usually takes the form of repetitive phrases in the texts. This empirical difficulty brings an

epistemological problem that how the researcher find and stay in a proper position between the research object and the evidence she can perceive. When the evidence usually takes the form of written or verbal narratives, the researcher's understanding may be attracted and even absorbed into the empirically hegemonic discursive environment. Thus, the researcher needs to create and secure a conceptual space separating the research object and evidence available to avoid the pitfall.

In the specific study of China, the high consistency in policy narratives makes a study of "official discourse" easily a study of the Communist Party's propaganda. I had been confronted by similar criticism when presenting a portion of this dissertation before. However, despite the derogatory perception for propaganda, what the official discourse in China presents is the constant ambition and attempt to construct a discursive hegemony thereby perpetrating the government's rule through a manufactured consent.

What can a researcher do to avoid the pitfall of absorption? The first strategy I think is comparative methods. Internal comparison between the narratives and action of identifiable actors, or a comparison of fewer discourses across time is one way. External comparison between China and the other nations can be another.

Another great limitation of the discursive hegemony framework is that it is weak in address questions about equity, and perhaps most of the normative questions existing in a system. Normative questions are the center of political studies as my personal belief, and equity is particular the core of contemporary environmental politics in one basic aspect, for example, the distribution of environmental costs (Martinez-Alier, 2002). Discursive hegemony has strength in delineating what makes of the dominance and

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where a possible subversive counter power may lie, but such a formative analysis asks about "how" a process came about or may happen, instead of inquire "right" or "wrong." Even though in my research, I tried to point out the problem of the ethic of a neoliberal political economic philosophy, I could not push much further as it would become irrelevant to the subject matter. However, focusing on particular normative ideas rather than a behavior change as this dissertation did, and employing a discursive hegemony approach by asking "what conditions make the particular idea honored or dismissed?", "what practices are deemed suitable for the normative idea?", "what kind of political or social mechanisms can facilitate the desired practices?", may produce fruitful insights.

A Note on Power

Power is one, and probably the top one, among the most elemental but contested concepts in the study of politics. Robert Dahl's classic definition where power is considered the ability of one actor to make the other do something that it otherwise would not do has had great influence among the American political scientists and IR scholars (Dahl, 1957, p. 203). This formulation emphasizes intentional control and materialistic quality of power. Although IR structuralists brought up the issue of unintended consequences, which was one core critique of Dahl's definition and attempted to move beyond an agent-centered worldview (Waltz, 1979), neorealism, as Litfin (1994) argues, could not escape from the conventional way of conceptualization, because the neorealist notion of power is still by and large materially based (Knorr, 1975) and is measured in relative rather than absolute terms (Grieco, 1988).

IR neoliberals confront this materialistic quality power, and advocate the structural effects of some non-material sources as institutions and ideas in "shaping and shoveling" actor's behavior (Goldstein & Keohane, 1993). With "soft power" being brought to the horizon (Nye, 1990), notions such as legitimacy, persuasion and even cultural attractiveness become understood as different faces of power. The conception of power is no longer monopolized by one discourse that power in international politics is synonymous to pure coercion and military forces.

With the "cultural turn" in IR theory in the 1990s, scholars start challenging the overall neo-neo rationalist project based on writings of several prominent post-Marxist thinkers such as the Frankfurt School, Gramsci, and Foucault. Their works are often labeled post-positivists and are engaged in questioning why and how politics is made in certain ways. They also go beyond the materialist tradition of Marxism and tend to pay special attention to the "superstructure" of societies with specific historical and politico-economic contexts, eventually presenting that power is not just about producing effects, but also about producing the criteria for certain kinds of effects to be counted. In other words, they deconstruct the ways in which power is articulated (Cox, 1986; Campbell, 1998). This kind of power is deeply intertwined with consent and the operation of knowledge, and it is the power I have presented through this study as discursive hegemony.

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Appendix A: The Construction of Global Climate Change Regime[69]

Year	Events	Significance and Progress
	Agenda Formation Stage	
1972	UN Conference on the Human Environment in Stockholm	Necessity and urgency for scientific research on climate change was promoted and accepted.
1979	First World Climate Conference in Geneva	Scientific efforts were mobilized to mainstream climate research. World Climate Programme was established.
1980-87	Conferences in Villach and Bellagio	Professional communities of scientific and policy fields worked closely together, marking the transition of the climate issue from science to politics.
1988	Toronto Conference	Participants concluded on the "Toronto targets" which called upon states to reduce their CO_2 emissions 20% below 1988 levels by 2005. Conference was first international effort at the UN-level to set concrete target and timetable for controlling GHG emissions. Participants also agreed to establish the Action Plan for the Protection of the Atmosphere and a world atmosphere fund.
1988	Intergovernmental Panel on Climate Change (IPCC)	IPCC was formed.
1989	Noordwijk Ministerial Meeting	The first high-level intergovernmental meeting focusing specifically on the climate change issue
1990	Second World Climate Conference	Conflict in positions among Western industrialized countries and between the Northern and Southern countries became evident
1990	IPCC First Assessment Report The UN Assembly Resolution for establishing Intergovernmental	The report provided crucial support for the first INC meeting.

	Negotiating Committee (INC)	
Negotiation Stage		
1991	INC launched first official negotiations	Climate change has been transformed to a political problem that involved governance of the atmosphere, economic and social development of the South, and global equity
1992	UN Conference on Environment and Development in Rio	Framework Convention on Climate Change (FCCC) was signed by 166 countries until June 19, 1993
1994	FCCC enter into force	FCCC became effective on March 21, 1994
Mar. 1995	First Conference of Parties (COP-1) in Berlin	The Berlin Mandate initiated a process of negotiating a protocol to the FCCC that would contain binding targets and timetables beyond 2000.
1997	COP-3 in Kyoto	The Kyoto Protocol (KP)
2001	COP-7 in Marrakesh	The Marrakesh Accords announced an increase in funds to the GEF, and the creation of three new funds—the Special Climate Change Fund[70], the Least-Developed-Country Fund[71], and the Adaptation Fund.
2002	World Summit for Sustainable Development in Johannesburg; COP-8 in New Delhi	Delhi Declaration affirmed sustainable development to be a guiding principle for coping climate change
2003	COP-9 in Milan	Decisions (among few outcomes) were made on sinks projects in the Clean Development Mechanism and on guidelines for the operation of the SCC Fund and the LDC Fund.
Operationalization/Continued Negotiation Stage		
2005	EU Emissions Trading	Russia ratified KP in November 2004,

[70] The SCCF is designed to finance activities related to adaption, technology transfer, development of policies and measures in a number of different sectors, and diversification of economies.

[71] The Least-Developed-Country Fund aims to assist these countries in the preparation and implementation of national action plans as required under the FCCC

	launches KP enters into force	bringing KP into force in February 2005.
2006	CDM opens	
2007	IPCC Fourth Assessment Report COP-13 in Bali	Bali Road Map charted the course for a new negotiation process beyond 2012. A twin-track negotiating process for the goal was assigned to two subsidiary bodies: AWG-LCA focusing on elements of long-term cooperation including mitigation, adaptation, finance and technology transfer; and AWG-KP aiming work on emission targets for developed countries. The results were expected to be delivered at COP-15 in 2009.
2008	Joint Implementation Mechanism starts	
2009	UN Climate Change Summit in New York COP-15 in Copenhagen	The Copenhagen Accord merely acknowledged the 2°C limit, and committed industrialized countries to providing $30 billion as fast-start money for adaptation and mitigation activities in developing countries by 2012. It did not contain quantified emissions reduction goals, and only required industrialized countries to set their own 2020 emissions targets with baseline years of their own choices. Mandates for AWG-LCA and AWG-KP were extended for the post-2012 climate regime.
2010	COP-16 in Cancun	The Cancun Agreements established the Green Climate Fund (proposed to be $100 billion per year by 2020), the Technology Mechanism of the FCCC, and the Cancun Adaptation Framework. No agreement was made on how to extend the KP or how the funds for GCF would be raised.
2011	COP-17 in Durban	The Durban Platform entailed the process (ADP) for a legally binding treaty to be defined by 2015 and become effective in 2020, and it will for the first time include developing countries such as China and India, as well as the US. The conference also led to an agreement on a management framework for the GCF.

2012	COP-18 in Doha	The Doha Climate Gateway contained the Doha Amendment, an eight-year extension of the Kyoto Protocol until 2020. Language on loss and damage was formalized for the first time in the conference documents, while no substantive progress could be made on the funding.
2013	COP-19 in Warsaw	The Warsaw Outcomes addressed little substantive issues except proposing a for addressing loss and damage of impacts due to climate change in developing countries.
2014	IPCC Fifth Assessment Report COP-20 in Lima	The Lima Call for Climate Action committed parties to bring forward their "Intended Nationally Determined Contributions (INDCs)" to the Paris agreement.
2015 (forthcoming)	COP-21 in Paris	

Appendix B: China's Foreign Energy Reliance

Year	Oil (Thousand barrels per day)			Total Energy (Quadrillion Btu)		
	Import	Consumption	foreign oil dependence	Import	Consumpt-ion	energy dependence
1990	123.0	2296.4	5.4%	-2.384	26.989	-8.8%
1991	210.8	2498.8	8.4%	-1.463	28.159	-5.2%
1992	375.8	2661.6	14.1%	-1.062	29.263	-3.6%
1993	667.7	2959.5	22.6%	-1.943	29.379	-6.6%
1994	617.5	3160.6	19.5%	-0.007	33.278	0.0%
1995	772.4	3363.2	23.0%	-0.288	34.592	-0.8%
1996	893.7	3610.1	24.8%	-0.082	36.696	-0.2%
1997	1343.3	3916.3	34.3%	-0.123	35.966	-0.3%
1998	1200.4	4105.8	29.2%	0.695	36.476	1.9%
1999	1376.6	4363.6	31.5%	1.518	37.029	4.1%
2000	1965.5	4795.7	41.0%	2.052	39.765	5.2%
2001	1942.5	4917.9	39.5%	0.887	41.201	2.2%
2002	2093.4	5160.7	40.6%	1.084	43.479	2.5%
2003	2602.3	5578.1	46.7%	1.721	49.978	3.4%
2004	3360.1	6437.5	52.2%	3.541	57.913	6.1%
2005	3470.2	6795.4	51.1%	4.009	64.422	6.2%
2006	3819.9	7263.3	52.6%	6.098	70.390	8.7%
2007	4137.1	7479.9	55.3%	5.963	74.853	8.0%
2008	4519.2	7697.1	58.7%	5.946	78.939	7.5%
2009	5184.2	8069.8	64.2%	8.710	85.989	10.1%
2010	5777.3	8938.4	64.6%	10.693	94.922	11.3%
2011	6123.5	9504.0	64.4%	13.084	103.651	12.6%
2012	5188.4	10175.1	51.0%	15.406	110.604	13.9%

Source: (USEIA, 2015)

Appendix C: Oil Market in China

Year	Total production	Total consumption	Crude import	Crude export	Refined product import	Refined product export
1992	2851.94	2661.60	230.03	430.19	145.75	136.87
1993	2903.46	2959.49	312.86	389.66	354.84	79.96
1994	2957.31	3160.61	251.94	370.83	365.56	98.74
1995	3059.62	3363.16	349.27	345.93	423.18	112.67
1996	3211.29	3610.09	459.83	406.58	433.84	111.47
1997	3284.56	3916.27	717.89	397.66	625.41	159.66
1998	3301.74	4105.83	579.41	312.86	620.95	144.64
1999	3317.03	4363.60	744.74	143.74	631.88	147.87
2000	3377.53	4795.71	1400.54	206.12	565.00	218.71
2001	3434.63	4917.88	1353.28	151.01	589.22	258.02
2002	3534.86	5160.71	1394.78	153.26	698.65	292.90
2003	3572.91	5578.11	1805.80	162.67	796.51	337.09
2004	3674.75	6437.48	2448.90	109.50	911.20	365.74
2005	3809.02	6795.44	2598.90	161.34	871.27	454.57
2006	3884.35	7263.33	2904.70	127.26	915.19	332.45
2007	3958.34	7479.92	3264.00	77.68	873.14	388.62
2008	4039.27	7697.13	3577.86	84.76	941.34	421.33
2009	4074.54	8069.82	4081.89	103.68	1102.29	611.11
2010	4372.66	8938.36	4753.64	60.60	1023.69	637.52
2011	4369.98	9504.05	5051.66	177.18	1071.81	614.80
2012	4459.21	10175.14	4081.89	103.68	1106.50	588.85

Source: USEIA (2015)

Appendix D: Breakdown of CO$_2$ Emissions from Primary Energy Consumption and Intensity Indicators

Year	Total CO2 Emissions	Sources of CO2 Emissions by Energy Type					
		Coal		Petroleum		Natural Gas	
	Million Metric Tons	Million Metric Tons	% of Total	Million Metric Tons	% of Total	Million Metric Tons	% of Total
1980	1448.47	1161.75	80.2	255.87	17.7	30.84	2.13
1981	1439.84	1165.45	80.9	246.91	17.1	27.48	1.91
1982	1506.85	1243.43	82.5	240.15	15.9	23.27	1.54
1983	1593.46	1315.03	82.5	249.33	15.6	26.32	1.65
1984	1724.70	1445.79	83.8	252.16	14.6	26.75	1.55
1985	1857.99	1556.10	83.8	273.98	14.7	27.91	1.50
1986	1970.77	1646.96	83.6	294.26	14.9	29.56	1.50
1987	2103.07	1760.27	83.7	312.61	14.9	30.19	1.44
1988	2240.32	1881.31	84.0	328.27	14.7	30.74	1.37
1989	2275.55	1897.81	83.4	346.90	15.2	30.84	1.36
1990	2268.89	1904.14	83.9	334.56	14.7	30.19	1.33
1991	2369.34	1974.29	83.3	363.82	15.4	31.22	1.32
1992	2448.88	2042.66	83.4	374.66	15.3	31.56	1.29
1993	2565.39	2105.98	82.1	426.37	16.6	33.03	1.29
1994	2754.01	2275.03	82.6	444.17	16.1	34.81	1.26
1995	2851.78	2340.25	82.1	475.67	16.7	35.85	1.26
1996	3005.78	2484.40	82.7	481.55	16.0	39.83	1.33
1997	2918.22	2336.09	80.1	539.13	18.5	42.99	1.47
1998	2916.26	2335.46	80.1	536.12	18.4	44.68	1.53
1999	2932.72	2312.43	78.8	572.06	19.5	48.24	1.64
2000	3165.32	2474.13	78.2	643.11	20.3	48.07	1.52
2001	3226.52	2514.61	77.9	657.90	20.4	54.02	1.67
2002	3422.09	2670.56	78.0	692.69	20.2	58.84	1.72
2003	3959.97	3179.66	80.3	716.91	18.1	63.40	1.60
2004	4596.97	3671.93	79.9	850.17	18.5	74.87	1.63
2005	5116.35	4135.69	80.8	888.58	17.4	92.08	1.80
2006	5575.20	4536.33	81.4	927.92	16.6	110.95	1.99
2007	5908.43	4810.68	81.4	959.18	16.2	138.57	2.35
2008	6166.57	5019.67	81.4	995.20	16.1	151.70	2.46
2009	6816.10	5534.88	81.2	1107.28	16.2	173.94	2.55
2010	7388.50	6018.33	81.5	1160.42	15.7	209.76	2.84
2011	8126.69	6612.72	81.4	1256.64	15.5	257.33	3.17
2012	8106.43	6512.70	80.3	1305.65	16.1	281.32	3.47

Source: USEIA (2015); World Bank (2015)

| Year	Intensity Indicators		
	Energy Intensity	Carbon Intensity	Emissions Intensity
	Btu / U.S. Dollars 2005 Constant	Metric Tons CO2 / Thousand U.S. Dollars 2005 Constant	Million Metric Tons CO2 / Qbtu
1990	49462.2721	4.1427	83.7545
1991	47662.2400	3.9992	83.9066
1992	43426.2488	3.6239	83.4488
1993	38330.1717	3.3436	87.2320
1994	38433.4452	3.1729	82.5552
1995	35471.8490	2.9047	81.8870
1996	33934.1747	2.7556	81.2041
1997	33959.6530	2.7771	81.7775
1998	32546.9173	2.6320	80.8673
1999	29848.2174	2.3837	79.8597
2000	28888.4376	2.3089	79.9258
2001	27746.1389	2.1853	78.7605
2002	28247.0684	2.2558	79.8590
2003	28756.4059	2.2999	79.9774
2004	29330.3453	2.3401	79.7825
2005	30092.3837	2.4209	80.4488
2006	29205.1573	2.3339	79.9130
2007	27326.1955	2.1781	79.7061
2008	26684.5353	2.0999	78.6928
2009	27144.2920	2.1784	80.2510
2010	26273.9237	2.0828	79.2717
2011	26130.8181	2.0775	79.5050

Appendix E: Temporal View of Use of Words

Google Ngram Searches in English Corpus
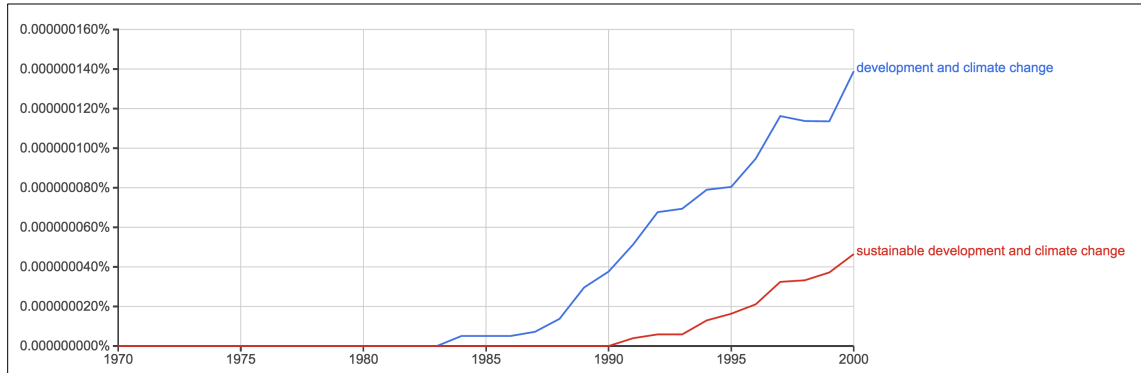
Google Ngram Searches in Chinese Corpus
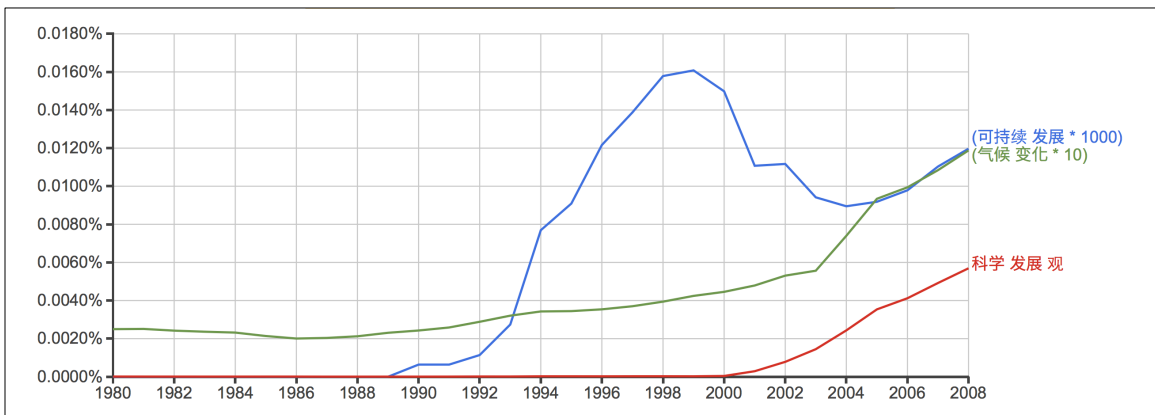
Blue: "sustainable development"
Green: "climate change"
Red: "science-based development"

Appendix F: Environmental and Resource Laws of China

1979	Environmental Protection Law
1984	Law on the Prevention and Control of Water Pollution
	Forest Law
1985	Grassland Law
1986	Fisheries Law
1987	Law on the Prevention and Control of Atmospheric Pollution
1988	Law on Wildlife Protection
	Water Law
	Mineral Resource Law
1989	(R) Environmental Protection Law
1991	Law on Soil and Water Conservation
1992	Ratification of the Convention on Biodiversity
	Ratification of the Framework Convention on Climate Change
1993	Agriculture Law
1995	Law on the Prevention and Control of Atmospheric Pollution
	Law on the Prevention and Control of Environmental Pollution Caused by Solid Waste
	Electric Power Law
1996	Law on the Prevention and Control of Environmental Noise Pollution
	Ratification of the Marine Convention
	(R) Law on the Prevention and Control of Water Pollution
	(R) Mineral Resource Law
	Law on the Coal Industry
1997	Law on Energy Conservation
	Flood Prevention Law
	Law on Protecting Against and Mitigating Earthquake Disasters
1998	(R) Forest Law
1999	Meteorology Law
	Marine Environment Protection Law
2000	(R) Law on the Prevention and Control of Atmospheric Pollution
	(R) Fisheries Law
	Law on Seeds

2001	Law on the Prevention and Control of Desertification
2002	Law on the Promotion of Clean Production
	Law on Environment Impact Assessment
2002	(R) Water Law
	(R) Grassland Law
	(R) Agriculture Law
2003	Law on the Prevention and Control of Radioactive Pollution
2004	(R) Law on Wildlife Protection
	(R) Law on the Prevention and Control of Environmental Pollution Caused by Solid Waste
	Ratification of the border treaty of EEZ and CS between PRC and Vietnam
	(R) Law on Seeds
	(R) Fisheries Law
2005	Renewable Energy Law
	Law on Animal Husbandry
	Accession to The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques
2006	Accession to "Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
	Ratification of The 1996 Protocol of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
2007	(R) the Energy Conservation Law
2008	Circular Economy Promotion Law
	(R) the Law of on the Prevention and Control of Water Pollution
	(R) Law on Protecting Against and Mitigating Earthquake Disasters
	Approval of the Revised Convention on the Physical Protection of Nuclear Materials
2009	(R) Renewable Energy Law
	Resolution of the Standing Committee of the National People's Congress on Making Active Responses to Climate Change (on 08.27)
2010	Law on the Protection of Petroleum and Natural Gas Pipelines
	Law on Water and Soil Conservation
2011	(R) Law on the Coal Industry

	(R) Law on the Promotion of Clean Production
2012	(R) Law on Agriculture
	(R) Law on the Promotion of Agricultural Technologies
2013	(R) Law on the Coal Industry
2014	(R) Environmental Protection Law

(R) indicates revision
Sources: Lexis-Nexis; Legislative Affairs Office of the State Council (2015)