

The Emergence of Low Carbon Development in China and India: Energy Efficiency as a Lens

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Abstract

Low-carbon development (LCD) in China and India is crucial to global sustainability. As representatives of the emerging world, China and India have to tackle the LCD challenge at the same time as they address rapid urbanization, industrialization and globalization, making this process an unprecedented problem in policy and practice. My dissertation uses a comparative perspective to examine the unique institutional change processes of China and India's LCD during the period of late 1970s to the present day - through the lens of energy efficiency (EE).

I argue that despite the manifold differences in political, economic and social contexts in contemporary China and India, the process of institutional development and change in EE reveals some similar mechanisms. I investigate the common mechanisms through a five-phase framework, and find:

First, in both countries, EE was initially triggered by complicated interactions between international and domestic crises. Second, through processes of political negotiation led by various policy groups, EE was conceived and planned by each state to embody not one single objective but multiple political, economic and social development goals. Third, in order to realize EE, an organizational complex formed within an existing governance structure. Fourth, detailed policy processes (which both shape and are shaped by their institutional settings) emerged from the previous stages. Finally, EE institutions are stabilized jointly through legalization and the establishment of specialist technical subfields.

I argue that the key mechanism of the five-phase process of institutional change is the *bundling structure* between EE organizations and the host governance structure. While in China the latter is the structure of economic governance, in India it is that of energy governance. These bundling structures imprinted multiple path-dependencies from the host governance structure to the newly developed EE regime, which in turn determine the long-term impact of EE on LCD in China and India.

My original contributions are threefold. First, this project is one of the first scholarly attempts to systematically make sense of LCD in large and complex countries with fast economic growth by using the perspective of institutional change. Second, drawing on broad theoretical resources and through an interdisciplinary exploration, the thesis tries to construct a *cause-effect*, *systemic*, and *political-economic* theory of LCD in contemporary China and India. Finally, my comparative framework adds a systemic and nuanced methodological viewpoint to the emerging field of multidisciplinary China-India comparative scholarship.

Abbreviation

ABE, Advisory Board on Energy (India)
BEE, Bureau of Energy Efficiency (India)
CII, Confederation of Indian Industries (India)
COP, Conference of Party
CPC, Communist Party of China
CSE, Centre for Science and Environment (India)
DoP, Department of Power (India)
EconC, Economic Commission (China)
EC, Energy Conservation
ECBC, Energy Conservation Building Code (India)
ECER, Energy Conservation and Emission Reduction (China)
ECTRS, EC Target Responsibility System (China)
EE, Energy efficiency
EESL, Energy Efficiency Services Limited (India)
EMC, Energy Management Centre (India)
ESCO, Energy Service Company
FPC, Fuel Policy Committee (India)
FYP, Five-Year Plan
GoI, Government of India
GRIHA, Green Rating for Integrated Habitat Assessment (India)
HA, Home Appliances
ICCN, International Climate Change Negotiation
IEA, International Energy Agency
IEP, Integrated Energy Policy (India)
IMCWG, Inter-Ministerial Coordinating Working Group (China)
IMWG, Inter-Ministerial Working Group (India)
IPCC, Intergovernmental Panel on Climate Change
JDXX, Jia Dian Xia Xiang (Household Electrical Appliance Going to the Countryside policy in China)
JCHG, Jieneng Chanpin Huimin Gongcheng energy-efficient products for the benefit of the people

LCD, Low Carbon Development

LBL, Lawrence Berkeley National Laboratory (USA)

MEP, Ministry of Environmental Protection of the People’s Republic of China

MNRE, Ministry of New and Renewable Energy (India)

MoEF, Ministry of Environment, Forest and Climate Change (India)

MoP, Ministry of Power (India)

MoF, Ministry of Finance (India)(China)

MUD, Ministry of Urban Development

NAO, National Audit Office (China)

NAPCC, National Action Plan on Climate Change (India)

NDRC, National Reform and Development Commission (China)

NECO, Nodal Energy Conservation Organization (India)

NMEEE, National Mission on Enhancing Energy Efficiency (India)

NTPC, National Thermal Power Corporation Limited (India)

OECD, Organization for Economic Co-operation and Development

PMCCC, Prime Minister’s Council on Climate Change (India)

PMLGCCEC, Prime Minister’s Leading Group on Climate Change and Energy Conservation (China)

PSU, Public Sector Undertakings (India)

RDA, Regionally Decentralized Authoritarianism

SEC, State Energy Commission (China)

SOE, State Owned Enterprises (China)

SPC, State Planning Commission (China)

TERI, The Energy and Resource Institute (India)

WGEP, Working Group on Energy Policy (India)

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Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history (p. 2)...Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development (p. 13).

- Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report*.

我们既要绿水青山，也要金山银山。宁要绿水青山，不要金山银山，而且绿水青山就是金山银山。

We want both clear water and green mountains as well as golden and silver mountains. And if we have to choose between the two, we would rather choose clear water and green mountains over gold and silver. In fact, clear water and green mountains can bring us gold and silver.

- The Chinese President Xi Jinping, conversation with students at Nazarbayev University in Astana, Kazakhstan, 7th September, 2013.

जिस उर्जाका उपयोग ना हुवा हो, वो सबसे साफ उर्जा है। इससे आर्थिक नुकसान नहीं होगा। आर्थिक व्यवस्थाको नई दिशा मिलेगी। हमारे भारत वर्षमें प्रकृति के प्रति आदर भाव आध्यात्म का अभिन्न अंग हैं। हम प्रकृति के देन को पवित्र मानते हैं।

Energy not consumed is the cleanest energy. It doesn't mean that economies will suffer; it will mean that our economies will take on a different character. For us in India, respect for nature is an integral part of spiritualism. We treat nature's bounties as sacred.

- The Indian Prime Minister Narendra Modi, General Debate of the 69th Session of the United Nations General Assembly, 27th September, 2014.

CHAPTER 1. INTRODUCTION

This introductory chapter rationalizes the research topic, pinpoints the objectives, explains the epistemological concerns, justifies the methodologies and lays out the chapter summaries.

1.1 Rationale

1.1.1 Low-carbon development

Climate change is one of the most pressing threats to humanity today (Rockström et al., 2014). Carbon emissions generated by human activities have been increasingly contributing to climate change (IPCC, 2007 & 2014). Low-carbon Development (LCD)¹ is the solution acknowledged by all countries. Globally, China and India face the greatest challenges. They are homes to nearly 40% of the world's population. Combined, they are projected to account for more than half of the increase in global energy consumption by 2035 (BP, 2014). At the same time, they have also become leading global GHG emitters, ranking first and third in the top list of emitting countries since 2010 (IEA, 2012).² Given the scale of their populations, energy demands, and carbon emissions, as well as the size and significance of their environmental problems and related health risks,³ China and India's transition to a

¹ “Low-Carbon Development” as a concept was adopted in the UNFCCC in Rio, 1992. It contains the same meaning with the term low-emission development strategies (LEDS): “forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth” (IEA, 2010a, p. 6). Also see UN Sustainable Development Knowledge Platform, available: <https://sustainabledevelopment.un.org/index.php?menu=1448> [last assessed on 27th Jan, 2015].

² EU countries are counted separately in this case. If the EU is counted as a whole, India is 4th in global ranking.

³ The Environmental Preference Index (EPI, Yale) that looks at overall pollution rating including factors such as health impact and water sanitation, put India at 155 out of 178

low-carbon economy will play a crucial role in the global effects of climate change and the livelihoods and the health of their respective populations.

Table 1.1 China and India's significance to the world's energy scenario (unit: share of the world; compiled by the author)

	China	India	China+ India
Population (Source: Census of China and India, 2012)	19.13%	17.09%	36.22%
Economy (Nominal GDP, Source: World Bank 2012)	11.36%	2.54%	13.90%
Energy Consumption (Source: BP, 2012)	21.92%	4.52%	26.48%
Carbon Emission (Source: UN, 2010)	26.43%	6.41%	32.84%

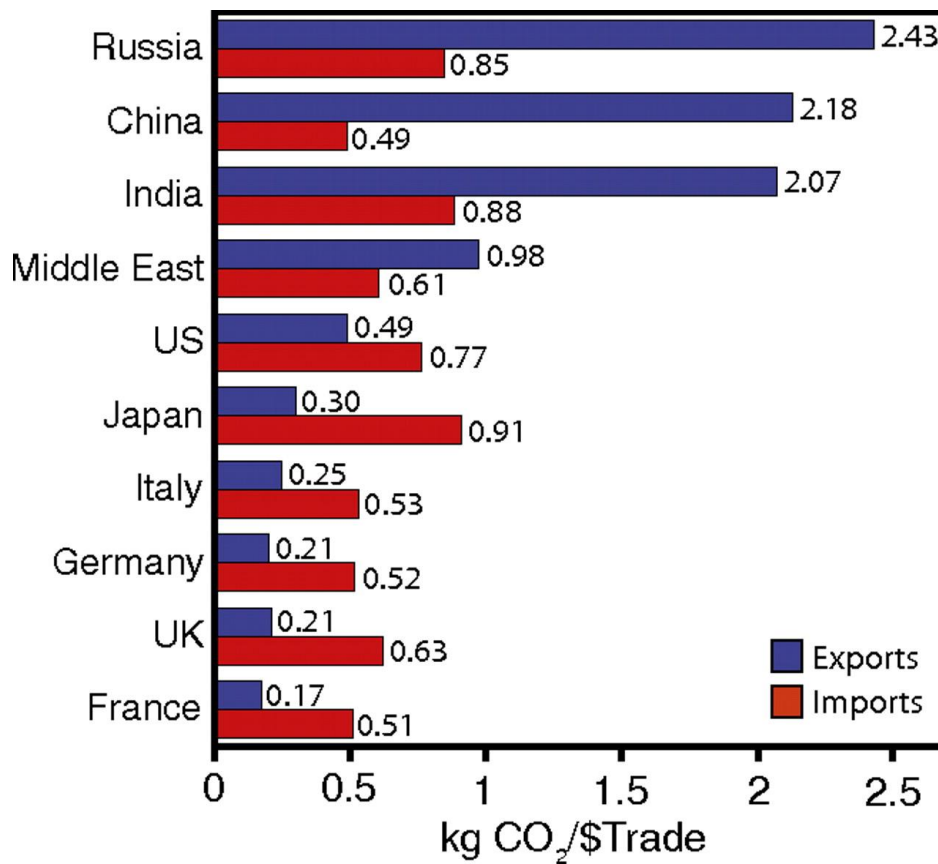
However, decarbonizing the complex economies of large countries at the same time as rapid industrialization, urbanization and globalization, is unprecedented in human history. Table 1.2 compares China and India with four typical industrial countries: Japan, Germany, UK and US. Compared to China and India, the four industrial countries have significantly higher level of economic development (per capita GDP), industrialization (value added industry), and urbanization (urban population). Not surprisingly, their energy intensities are substantially lower than China and India, as they seemed to have achieved a more advanced and more energy-efficient economy altogether. Yet, when we look at their carbon emissions calculations based on actual

countries (EPI, 2014). According to the World Health Organization, India has the world's highest death rate due to chronic respiratory diseases, and has more deaths from asthma than any other nation (WHO, 2008). Although China performed somewhat better than India in the same Index (ranked 118), it faces no less threat than India: report released by the Ministry of Environmental Protection of China showed that among the 74 major cities surveyed in 2013, 71 are "polluted" or "heavily polluted" (MEP, 2013). About 57 percent of groundwater in 198 cities in 2012 in China was "bad" or "extremely bad" according to government statistics (WBG, 2014).

consumption rather than merely the production activities taking place within each country's territory, we see a different picture.

Thanks to the deepening of globalization, especially the burgeoning international trade, carbon emissions generated from the production activities can be reallocated globally just like capital, labor, and land, the three factors of production. For instance, although the UK enjoys one of the lowest figures of energy intensity and carbon emissions in the world, its carbon imports are as high as 34%, meaning that the UK actually consumed more than one third of the normally reported carbon emission (production-based emission). The same indicator in Germany is 29%, in Japan is 19% and in the US is 13%. On the contrary, both China and India are net carbon emission exporters. Nearly 20% of China's carbon emissions, and 10% of India's, are consumed by the rest of the world. Figure 1.1 portrays this imbalance in a clearer way.

Figure 1.1 Carbon emission intensity of imports and exports to and from the largest net importing/exporting countries



Source: Figure 3 in Davis and Caldeira (2010)

Table 1.2 China and India's rapid industrialization, urbanization and globalization and the implications for carbon emissions (compiled by the author)

	India	China	Japan	Germany	UK	US
GDP per capita (constant 2005 US\$)	1,086	3,122	36,203	38,470	39,809	44,342
Energy intensity (EIA, 2011)	17,486	24,708	4,574	4,457	3,588	7,328
Industry, value added (% of GDP)	33.1	46.6	26.1	30.5	21	20.8
Agriculture, value added (% of GDP)	18.4	10	1.2	0.8	0.6	1.4
Urban population (% of total)	31.00	51.00	91.00	75.00	82.00	81.00
Urban population growth (annual %)	2.40	3.20	0.60	0.30	1.10	0.90
Carbon Imports (Carbon Trust, 2011, Davis and Caldeira, 2010)	-10.5%	-18.9%	19%	29%	34%	13%

Notes:

1. Data are from World Bank online database 2011 unless separately referenced.
2. "Energy intensity" is defined as "total primary energy consumption per Dollar of GDP (Btu per Year 2005 USD [Market Exchange Rates])". Available at: <http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=92&pid=46&aid=2> [last accessed on 15 April 2015].
3. "Carbon imports" for each country is calculated as: (carbon emission calculated by consumption – carbon emission calculated by production)/carbon emission calculated by consumption. Raw data available at: <https://spreadsheets.google.com/spreadsheet/pub?hl=en&key=0AonYZs4MzlZbdEFUSFhxTWFMTEV2Rmk1Z3d3dFJmOEE&hl=en&gid=6> [last accessed on 15 April 2015]

Geographical transfers of carbon emissions via globalization from OECD countries to China, India and other emerging markets have accelerated since the 1990s (Peters et al, 2011). Unsurprisingly, this period overlapped the era of fast economic growth in emerging countries. This phenomenon embodies very important messages for LCD in the developing world: that LCD experiences today are relatively more energy-efficient and that those of developed countries are mixed. Despite the improvements in low-carbon technologies, management, investments, policies, and lifestyles – all of the elements of a standard LCD formula, the reallocation of carbon emissions through international trade plays a vital role in Low Carbon trajectories. In the past one hundred years, China and India have shown strong will to learn from and catch up with the industrialized world. They have successfully done so in many ways, particularly in economic growth. If China and India decide to emulate the darker side of the industrial countries' LCD, and copy the emissions transfer mode in the rest of the world, then, given the enormous volume of the Chinese and Indian population and economic potential, there is a high probability that it would bring enormous environmental disasters to the world (King et al., 2015).

Hence, China and India's LCD is uniquely challenging and crucially important today. For the welfare of their own people as well as for humanity as a whole, China and India have to determine and resolve the current trade-offs between economic growth and LCD without further delay. In practice, both discursively and in terms of institutional architecture, both have been trying to accomplish this “mission impossible” for more than three decades (since the late 1970s to the present). Their practices are worth reflecting on, irrespective of their success or failure. More

prominently, they have both been engaged in this struggle but on distinctive pathways. Comparing and contrasting their distinct LCD pathways enables us to make sense of key mechanisms⁴ of LCD in two large and complex countries with fast economic growth.

1.1.2 Institutional Change

China and India's struggle for an energy efficient, low-carbon and high growth economy essentially involves processes of institutional change. Institutions are the "rules of the game" that fundamentally shape the interplay between all the players' thinking and behaviors (North 1990, Ch1&2). Institutional change is a process leading to changes of the rules – of the shared concepts in a certain society – which would profoundly transform the landscape of the development agenda, process and consequences.

Despite of their drastically different cultural, social, economic and political contexts, India and China's common process of struggle for LCD has fundamentally changed the development thinking, policy practice, governance structure, and low-carbon institutions of the two countries. Willingly or reluctantly, today, China and India can no longer neglect LCD in their development agendas and mainstream public debates. Fifteen to twenty years ago, around the beginning of the new millennium, this was not the case. The problems of environmental sustainability, climate change and energy efficiency were loosely addressed or not even properly acknowledged by the development policy cohort and by public opinion in both countries. Now without doubt, "the rules of the game" have changed. In addition, the process of institutional

⁴I follow Bunge (1997)'s definition of mechanism: "a mechanism is defined as what makes a concrete system tick (pp. 410)... a process in a concrete system, such that it is capable about or preventing some change in the system as a whole or in some of its subsystems (p. 414)". I will come back to the concept of mechanism in 1.3.1.

change in LCD has mobilized many stakeholders in the two societies, ranging from politicians, bureaucrats, technocrats, think tanks, environmental advocacy groups, public and private enterprises, international organizations, technology researchers and developers to local communities. It has also mobilized massive political, social and financial resources at all levels. The changes in each of the players and the multiple interactions between them shape, and are continuously being shaped by one of the most exciting and ongoing institutional change processes in today's world – the LCD of China and India.

1.2 Objectives and Original Contributions

This thesis uses a comparative perspective to understand the institutional change process of China and India's LCD trajectories during the period of late 1970s to the present day, through the lens of energy efficiency. Theoretically, through an interdisciplinary exploration of this research topic, the thesis tries to construct a *cause-effect* (“*mechanismic*”⁵), *systemic*, and *political-economic* theory of LCD in contemporary China and India. In the end, I try to link the empirical and theoretical results of the study with the ongoing discussions about low-carbon policies and governance in large and complex developing countries with fast economic growth. Finally, my project tries to contribute a new framework to in-depth China-India comparative studies in interdisciplinary social science.

The original contributions are threefold. First, this thesis represents one of the first scholarly attempts to systematically make sense of LCD in large and complex countries with fast economic growth by using the perspective of institutional change.

⁵ I follow the definition of “mechanismic” as “Any explanation involving reference to a mechanism may be said to be *mechanismic*” (italic in original text) (Bunge, 1997, p. 411). The concept of “mechanism” will be addressed in the following section (1.3.1).

Second, drawing on broad theoretical resources and through an interdisciplinary exploration, the thesis generates a new analytical framework of LCD in contemporary China and India. Finally, my comparative framework adds a systemic and nuanced methodological viewpoint to the emerging field of multidisciplinary China-India comparative scholarship

1.3 Epistemology

In this section, I briefly explain four epistemic concerns of the project, which are 1. The concept of the mechanism, 2. A systemic and interdisciplinary approach, 3. China-India comparison and 4. Time, space and political economy. All of these topics will be revisited and further elaborated as appropriate in the theoretical and empirical chapters.

1.3.1 Mechanism

The critical transformation of China and India's LCD has attracted rich scholarship from all disciplines, particularly in the last decade. Yet, most of the existing literatures focus on the changes within separate domains of institutional change, such as ideas, technologies, organizations, policies, markets, governance, and lifestyles at different levels - international, national, sub-national, community, household, corporate and even individual.⁶ No doubt, all of these are critical factors for successful LCD. But, factors cannot function without mechanisms (Bunge, 1997). Factors are many pieces of precious stone, and even though they are well collected and polished, they cannot make a real necklace without a thread to put them together. LCD involves changes of thinking and behaviors (individually and collectively) from

⁶Academic articles, policy papers and investment reports about China and India's LCD are enormous. It is far beyond the thesis' remit and goal to identify them comprehensively. Focused literature reviews of my specific case studies will be carried out in both the theoretical and empirical chapters.

all players in a society. For example: a low-carbon technology cannot be produced or scaled up without collaborative inputs from research, private and public capital, and policy support, etc. Even if all of these elements are secured, a low-carbon technology cannot reach out to consumers without the functions and coordination of the market players (including the government as facilitator and participant). Even if the product reaches the consumers, the low-carbon idea it embodies will not be socially accepted without individual changes of ideas and lifestyles.

What triggers the idea of LCD to be realized through this complex process? What is the dynamic that makes all of the elements necessary for low-carbon changes work together? What drives this low-carbon realization process? Those questions point to the mechanisms of LCD. Without understanding the triggers, dynamics, and the drivers, we cannot make sense of the sustaining institutional change process of LCD in China and India. Therefore, the identification and political-social analysis of the triggers, dynamics, and drivers of the LCD mechanism are the goals of this research.

Nevertheless, the factors, the “precious stones” for a necklace can be experienced, observed and collected, while the mechanism(s), the thread(s) of the necklace are not easily perceivable. It can only be found through scientific research (Bhaskar, 1975).⁷

⁷In terms of the philosophical foundation of science and social science research, I follow the critical realism theory (Bhaskar, 1975), which proposed a stratified ontology (Table 1.3) that is constituted by Domain of Real (mechanisms/events/experiences), Domain of Actual (events/experiences), and Domain of Empirical (experience), without further explanation in the following texts. In this stratified ontology, the domain of the *real* refers to agencies that are independent of both mind and society; the domain of the *actual* refers to events that take place, while the domain of the *empirical* refers to what is observed or sensed by human beings. Bhaskar argued, “there is an ontological distinction between scientific laws and patterns of events” (p. 12). “[E]vents must occur independently of the experiences in which they are apprehended. Structures and mechanisms then are real and distinct from the patterns of events that they generate; just as events are real and distinct from the experiences they are

Partly because of the relative invisibility of mechanisms, and partly due to the attractiveness of emergent interests, along with flourishing funds for the various aspects of LCD, few studies have attempted to integrate the series of segmented factors into a systemic understanding of the mechanisms of LCD in China and India.⁸

To push this logic one step further, even if we have full knowledge about the mechanisms, they need ideas and power to function. Ideas and power need to be researched as well (Tang, 2011). There is no thread to make the necklace without the will, ideas and actions in the design of jewelry from one or a group of people, acting individually or together in processes that may be conflicting, harmonious or mixed. There will not be a mechanism for LCD institutional change if there is no low-carbon idea desired as a development objective by groups of people, and the power politics within or between them to push low-carbon change forward. Yet, the power politics of the mechanisms in LCD is rarely discussed in a systemic way within the framework of institutional change or policy studies.⁹ How do these inter-related

apprehended.” (p. 56) Because the domain of *real* (mechanisms) cannot be easily experienced (*empirical*) or observed (*actual*), scientific research is necessary for its discovery.

Table 1.3 Bhaskar’s three domains of stratified ontology (Table 0.1 in Bhaskar [1975, p. 13])

	<i>Domain of Real</i>	<i>Domain of Actual</i>	<i>Domain of Empirical</i>
<i>Mechanisms</i>	x		
<i>Events</i>	x	x	
<i>Experiences</i>	x	x	x

⁸Andrew-Speed (2012) investigates China’s low-carbon governance from the perspective of institutional change is among the very few. It attempted a systemic approach with an emphasis on path-dependence. My work is partly inspired by it. Critical reviewing of this piece of work will be seen in both the theoretical and empirical chapters.

⁹ Many studies have discussed about the politics of power in different sets of environment and climate change related issues, such as Lora-Wainwright (2014a, 2014b, 2014c), Lora-Wainwright, Zhang et al. (2012), van Rooij and Lora-Wainwright et al (2012), Lu and Lora-Wainwright (2014), Wang (2012), and Centre for Science and Environment (CSE) series reports on India’s environmental scandals and activities. It is beyond the scope of the thesis to

factors interact with each other in different political-economic contexts through time? What are the fundamental mechanisms that structure this multi-layered interplay? What is the complex power structure that fuels the dynamics of institutional change for LCD? This project is constantly interested in such questions. Without answering them, our understanding of LCD in China and India is just like the pieces of stone, fragmented and by themselves insufficient for a necklace.

1.3.2 Systems and interdisciplinary approaches

To answer these mechanistic questions, an interdisciplinary approach is necessary. It is not only because the intricacy of the researched topic requires knowledge from various disciplines, including science, engineering, economics, political economy, policy studies, international relations, sociology, environmental ethics studies, and so on; but, over and above the difficulties of transcending disciplines, paradigms and sub-fields, the open system phenomena¹⁰ that characterize climate change and LCD are constituted through multiple causal structures, mechanisms, processes or fields (Bhaskar, 2010).

A system is where a set of units or elements are interconnected so that any change in the elements or the relationship between elements will make other parts of the system change (Jervis, 1997, p. 5-7). In that way, a system can only be understood as a totality of the factors and their manifold interconnections, rather than the additive and cumulative collection of separate elements, because the additivity of these “reduced parts” separated from their relations is not the real system (Bhaskar, 1975, Jervis,

list them all. But the point here is that the pieces of the facts are well explored, if not sufficiently, yet the mechanistic explanations for the institutional change for LCD is lacking.

¹⁰ I follow Bhaskar (2010)’s definition of open-system phenomenon: “[U]nlike the closed systemic paradigm, they [open systems] are generated not by one, but by a multiplicity of causal structures, mechanisms, processes or fields (p. 4)”.

1997). In other words, LCD in China and India, as open-system phenomena, can only be studied in an appropriate way as a whole system, rather than being reduced to separate domains (and then adding them together). So although a mechanistic exploration needs to integrate the segmented facts of LCD, yet it requires scientific research on LCD as a system than merely juxtaposing the elements.

In addition, the transitioning socioeconomic contexts of contemporary China and India, the rapidly changing political environments for the climate change response and LCD both domestically and internationally, and the accelerating tensions between economic growth and environmental sustainability, collectively added to the complexity, multiplicity and interdependency of the systems' elements, factors and mechanisms.

Consequently, multidisciplinary becomes first of all an ontological foundation for the understanding of a multiplicity of mechanisms at different, including emergent, levels of reality (a laminated system) (Bhaskar, 2010, p. 4-10). Following that, interdisciplinary epistemologies and methodologies are necessary. The ontological request for multidisciplinary and the interdisciplinary approach significantly increase the difficulty of the project on the one hand; while on the other, provide an exciting opportunity to synthesize the emerging clusters of theories of several fields related to LCD in China and India, and to make sense of the theories in an integrated and synthesized way. For various reasons beyond the remit of this thesis, this is also likely the most viable route towards a mechanistic understanding of LCD in large developing countries.

1.3.3 China-India Comparison

Mechanisms can be traced and identified, but the multi-layered causal effects within the mechanisms may be difficult to justify and test if there is no comparative study involved.¹¹ It is true that this project focuses comparatively on China and India; it cannot reach any generalized conclusions due to the complexities of their contexts and histories. Yet it is still meaningful to extend the theoretical discussion beyond the two countries, in order to make some tentative contributions to the general understanding of LCD in large and complex countries with fast economic growth. Comparative analysis enables us to improve confidence in the mechanisms and the multiple causal effects that structure the interplay between critical factors in these case studies. It can also help in the attempt to build higher order generalization. China-India comparisons provide opportunities to contrast cases of completely distinct political-economic contexts, and to preparing fine-grained analyses – in this case to explore the fundamental mechanisms of LCD in developing countries.

Nevertheless, as China-India comparisons become a hotspot of social science research and popular writing alongside the economic emergence and the consequential political assertiveness of these two big powers on the global stage, the rigorousness of the comparative methodology remains to be immensely problematic. As Harriss-White (2013) insightfully argued, the competing mega-theories combined with the proliferating mini-theories in social science have made comparative study today a

¹¹ As Gary, Keohane and Sidney (1994) argued: “*the causal effect is the difference between the systematic component of observations made when the explanatory variable takes one value and the systematic component of comparable observation when the explanatory variable takes on another value.*” (p. 81-82, italic from the original text) Also see Lebow (2000): “To sustain causal inference it is generally necessary to engage in comparative analysis. Within the single-case format comparative analysis can take two forms: intra-case comparison and counterfactual analysis.” (p. 561)

crowded field - comparison has become more of an art than a science in which methodologies rarely get the thorough discussion and justification they deserve.

In my project, the systematic, mechanistic, and the inter-disciplinary approaches have quadrupled the trouble of methodological rigour for this China-India comparison. This epistemological and methodological challenges ask for an organic synthesis of theories from various paradigms, schools, approaches, and concepts, in order to avoid a weak, ambiguous and unsystematic comparison. With those alarms in mind, I pay attention to both the orthodox and heterodox streams of theories of institutional change from different fields. During this comparative exercise, I always ask the questions: do China and India share a similar institutional change process of LCD, or do they differ from each other and if so then how? If there are some differences, are the differences fundamental or emergent, mechanistic or factor-based? If the differences are purely due to factors, there is a hope to find mechanistic explanations that work for both systems. Then the comparison can be justified as an effective means towards the end. Only then will it be possible for some generalized conclusions to be reached.¹²

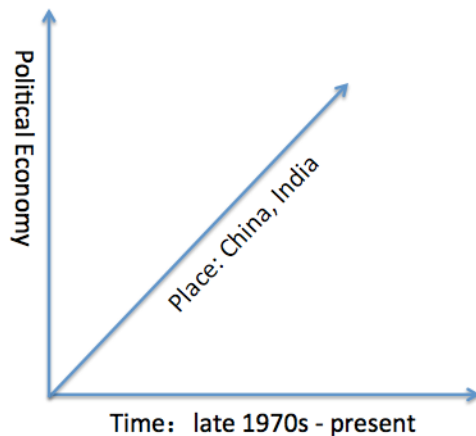
1.3.4 Time, space and political economy

The institutional change processes for LCD took place in certain places and during certain periods of time – starting from the late 1970s and lasting to the present day in China and in India. This process is inevitably contextualized in distinctive political economic settings over a 40-year period in both countries. The contextualization of the mechanisms is crucially important, because otherwise we run the risk of making

¹²This part, especially the challenges and theories of China-India comparative studies will be revisited and elaborated in the theoretical chapter (2.5.2).

faulty causal inferences (Falleti and Lynch, 2009). The specific context researched is constituted by three dimensions: time, space, and political economy (Fig.1.2).

Figure 1.2 Three dimensions of LCD institutional change process



As Pierson (2004) argued, without considering the dimension of time in analyzing social processes (which is quite often neglected in social science research), there are only “snapshots” rather than “moving pictures”. The snapshots are not only piecemeal but also prevent us from seeing the real picture. Similar actions happening at different times may bring divergent results. Similar things happening at the same time but with a different sequence may also change the effects. Adding the dimension of time to the analysis in a given political economic context therefore helps to drill into the multi-layered complexities of institutional change, such as path dependence, critical junctures, sequencing, duration, timing, unintended outcomes and so on (Pierson, 2004, p. 5-6). All these become useful analytical tools to capture the holistic moving pictures of the LCD process.

Nonetheless, even the same thing happening at the same time with the same sequence but in different places, will lead to diverse outcomes. China and India represent

distinctive political economic contexts in developing countries. Analyzing their LCD institutionalization process must take their idiosyncrasies into account. In addition, the different regions and their influences on LCD impose yet another layer of complexity in the discussion of the process of institutional change. The same low-carbon idea/technology/policy may generate different implications in places with different geographical conditions, such as climate, geology, hydrology, vegetation, housing styles, living habits, etc. For example, investing in efficient central heating system in northern China makes a lot of sense because it is heavily dependent on coal-burning - in 2012 alone, northern provinces of China burnt over 700 million tons of coals for heating.¹³ However, this low-carbon investment would make no sense in India, due to its different climate and geography that do not require any central heating system in most parts of India. It should be noted that, both the socio-economic and the physical parameters embodied in space deserve attention in the empirical analysis.

Equally essential is the fact that the Chinese and Indian systems are laminated by the persistence of continuity along-side drastic changes over time. To list chronologically a few significant political-economic changes relevant to LCD in the past 40 years: international oil crises (1974 and 1979), China's economic reform (early 1980s), India's economic liberalization (1980s-1990s), International Climate Change Negotiation (2000s), and the international financial crisis (2007-2009). All of these international and domestic events, with various sequences, combinations,

¹³ Chinese government official data, as cited in *China Daily* 30-01-2015. Available: http://www.chinadaily.com.cn/china/2015-01/30/content_19449162.htm [last assessed 24-07-2015].

interconnectivity and timing have affected the political-economic environments of China and India's LCD over time.

In this thesis, I pay particular attention to the integration of the dimensions of time and space with the political economic analysis for LCD, and carefully examine the intricate interactions between time, space, political economy and the LCD institutionalization process.

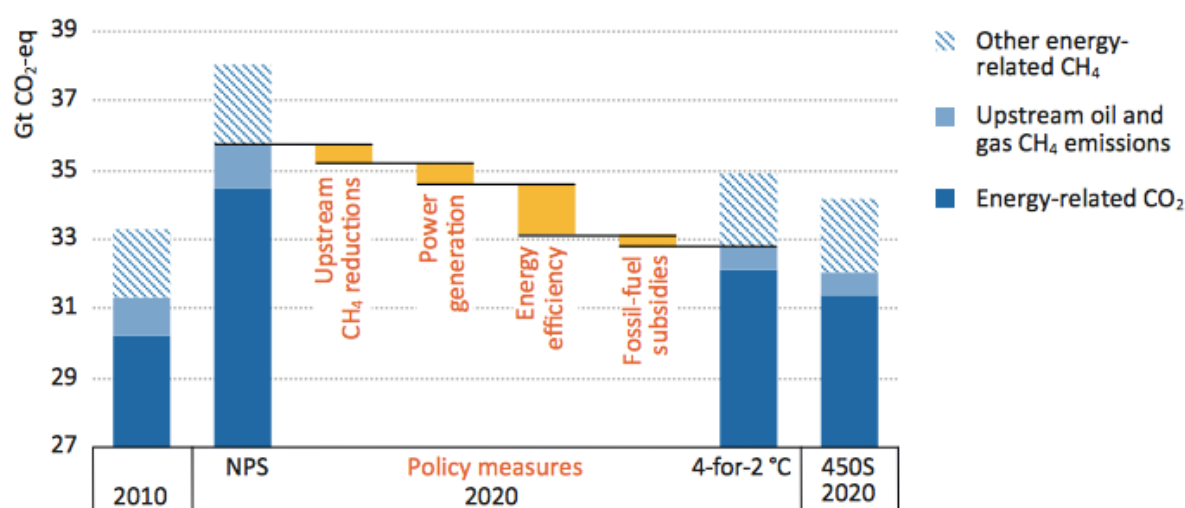
1.4 Energy efficiency as a lens

LCD is a broad concept consisting of all the methods that can achieve the goal of low-carbon-emissions and/or climate-resilient economic growth. It is neither the aim nor within the capacity of this doctoral project to address all the possible methods. In this thesis I choose energy efficiency as the lens into LCD for three reasons:

First, The Intergovernmental Panel on Climate Change's (IPCC) 5th Assessment Report demonstrates that climate change is best considered as a stock problem – how to limit the total amount of carbon emission over the entire industrial epoch, including the industrialized and the industrializing parts of the world. Energy conservation and/or energy efficiency is one of the direct solutions for controlling the stock of carbon emissions in short period of time. The IEA World Energy Outlook Special Report *Redrawing the Energy-Climate Map* (2013) argues that four key policy measures can keep the door open to the 2 °C target before a new climate agreement comes into force in 2020. Namely, adopting EE measures, phasing out inefficient coal-fired power plants, minimizing methane emissions from upstream exploration, and partially phasing out fossil fuel subsidies. Among them, EE alone could account

for 49% of the emissions reduction required to stay on course, making it the largest potential contributor (Fig.1.3).

Figure 1.3 Change in world energy-related CO₂ and CH₄ emissions by policy measure in the 4-for-2 °C scenario



Notes: Methane emissions are converted to CO₂-eq using a Global Warming Potential of 25. NPS = New Policies Scenario; 450S = 450 Scenario.

Source: Figure 2.2 of IEA (2013a, p. 51).

Second, Energy efficiency (EE), as defined below, is recognized by both Chinese and Indian governments as the most important “hidden fuel” in enhancing energy security as well as reducing GHG emissions. It is a crucial step for their LCD strategies. EE potentials in China and India are among the largest and also the most under-realized in the world. Furthermore, EE is considered by both Indian and Chinese governments to be a huge and cost-effective investment opportunity. India’s Bureau of Energy Efficiency (BEE) aims to unlock an estimated Rs. 74,000 crores¹⁴ of EE market opportunity (BEE, 2008), which was approximately 0.9% of GDP 2011-2012; while China projects an annual growth of 15% for the EE and Environmental Protection industries; and till 2015, the EP industry is aimed to reach a total value of 4.5 trillion

¹⁴Approximately equals to USD 17.3 billion calculating based on the exchange rate in June 2008, the month this data was announced by the Indian Government.

RMB,¹⁵ which equals 2% of GDP (NDRC, 2013). As will be elaborated in the thesis, EE in China and India embodies various meanings, making it a much broader and complex concept compared to the international standard. Thus, it provides a unique “nexus” to interrogate the multi-layered interactions between the multiple stakeholders of LCD. In addition, I am familiar with EE technologies and research networks due to undergraduate studies and over a decade of research in this area. Choosing EE as the lens assures both the representativeness of key LCD areas and the practicality of the project.

Finally, due to my own academic background in EE technology and policy research for a decade since undergraduate studies at Tsinghua University in Beijing, focusing on EE increases the feasibility of this project.

The next section defines EE for my project through a discussion of terms for energy conservation and energy efficiency. It then discusses the EE indicators that will be used in the thesis.

1.4.1 Energy Conservation vs. Energy Efficiency

It is necessary briefly to explain here the two related terms - Energy Conservation (EC) and Energy Efficiency (EE) - that will be frequently used in this thesis, because China and India use both forms in their policy discourse without the clear differentiation that our analysis requires. For example, India’s Energy Conservation Act 2001 constituted the nodal governmental agency Bureau of Energy Efficiency (BEE). In this crucial legislation for India’s EE development, the title of the Act used

¹⁵ Approximately equals to USD 735 billion calculating based on the exchange rate in August 2013, the month this data was announced by the Chinese Government.

the term EC, while the constitution of the regulatory body is named EE. In the Chinese context, though EC (*Jieneng* 节能) is more often used in the formal regulatory documents, the official explanation of EC is actually closer to the international definition of EE.¹⁶ The mixed usage of EE and EC might cause ambiguity in the subject of the comparative analysis in this chapter.

Energy Conservation (EC) will refer to all kinds of technologies and practices that can conserve energy consumption compared to current levels. Meanwhile, according to International Energy Agency (IEA), the most recent definition of EE is “a way of managing and restraining the growth in energy consumption. Something is more energy efficient if it delivers more services for the same energy input, or the same services for less energy input”.¹⁷ Similarly, Lawrence Berkeley National Laboratory (LBL) defined EE as “using less energy to provide the same service”.¹⁸ When IEA was created in 1974, EC was identified by IEA as an important step toward energy security among its member countries. Later, EE became part of the EC schemes. Around mid-1980s, EE became the major content of EC strategy in IEA. From late 1980s onwards, EE replaced EC to be the general term used in IEA documents (Scott 1994).

The reasons behind the gradual change in terminology of IEA documents are beyond the scope of this chapter. Nevertheless, EE is more widely used in international literature nowadays than EC. Therefore, I will adopt the general concept of EE that is well defined by IEA and LBL - in essential, **EE is all kinds of efforts that are made**

¹⁶ See Chapter 1 in *State Council Guidance on Energy Conservation* (1986) and Chapter 1 in *Energy Conservation Law of People's Republic of China* (1997, 2007).

¹⁷ See IEA website: <http://www.iea.org/topics/energyefficiency/> [last assessed 25/07/2014].

¹⁸ See LBL website: <http://eetd.lbl.gov/ee/ee-1.html> [last assessed 25/07/2014].

by all levels of stakeholders (government, market, NGO, communities, individuals, etc.), from both the supply side and the demand side, that can reduce the energy consumption for the same output. Whenever EC is used in policy documents in either China or India, the chapter will follow the official documents' terminology, while EE will be used in general narrative.

1.4.2 EE Indicators

Traditionally, countries use energy intensity as the major indicator of EE. Energy intensity is defined as the amount of energy consumed per unit of output. For standardization, the ratio of energy supply to GDP is a common way of calculating energy intensity (OECD, 2012, p.128). However, both scholars and policy practitioners have challenged its accuracy and comparability. Energy intensity is determined by multiple economic factors such as the overall economic structure, the type of major industry, the size of the economy, energy-related technology and even the exchange rate (IEA, 2014a, p17). Since these factors change independently or inter-dependently from time to time, using the single indicator of energy efficiency is problematic in understanding the complex process of EE development, especially in transitional economies like contemporary China and India. For example, because energy intensity is calculated internationally based on USD, the rapid depreciation of INR against USD in 2013 had caused a sudden statistical increase of India's energy intensity while the EE situation remained relatively unchanged.¹⁹

Along with the development of more comprehensive and sophisticated understanding and policymaking of EE in OECD countries, new frameworks of indicators are being

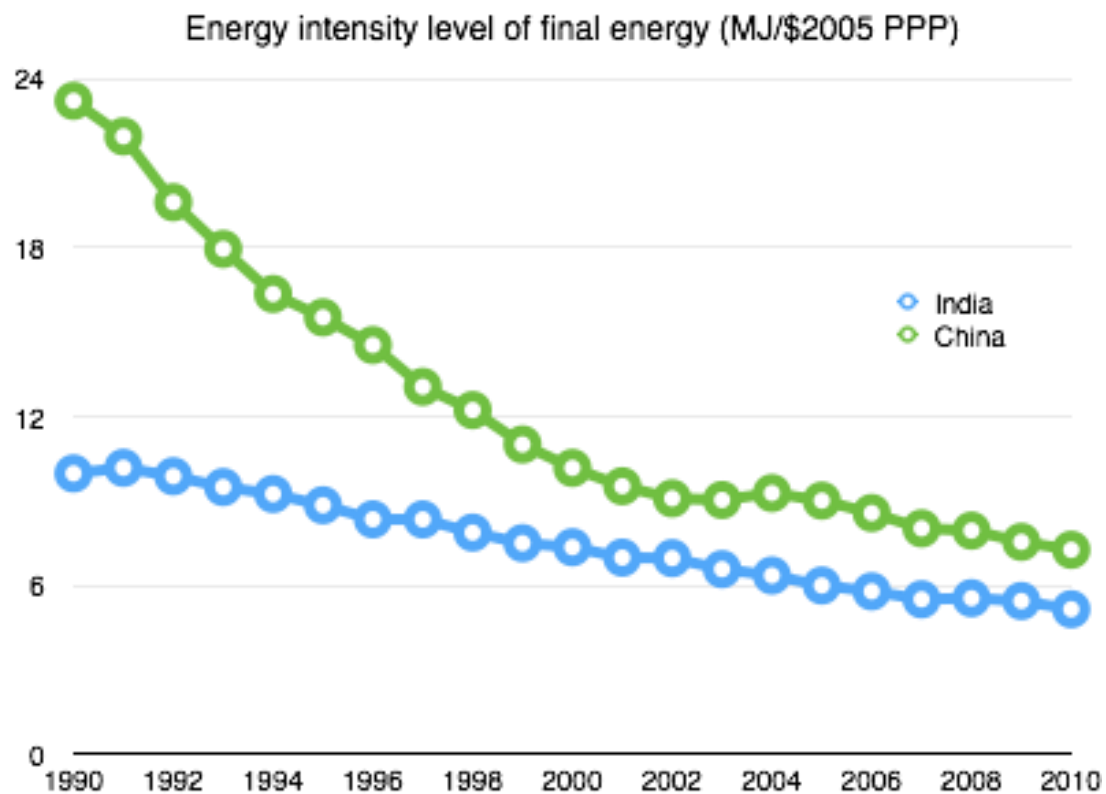
¹⁹Dr. Ajay Mathur, Director of the Bureau of Energy Efficiency (BEE) of India speech, February 7th 2014, Thematic Track on Promoting Energy Efficiency in Micro, Small and Medium Enterprises (MSMEs), Delhi Sustainable Development Summit (DSDS 2014), New Delhi. Based on Author's written record on the day of the speech.

developed, such as the decomposition/factorization methodologies that are proposed by IEA (2014b). However, the new set of indicators is still under-development. Therefore not enough data is available so far for conducting international comparative study based on the new schemes.

Considering the scope of the secondary data generated from the existing EE indicators, and bearing in mind their limitation as elaborated above, I adopt World Bank/IEA's historical energy intensity data of China and India as quantitative background references. However, it is worth noting that the World Bank/ IEA database is based on self-reported data from individual country governments. China and India are not IEA member countries, so IEA lacks the institutional legitimacy and capacity to crosscheck their energy data. The credit and comparability of energy intensity data can be questioned. Yet, since the longitude data is collected by individual countries using a consistent method, the trend of the data may be more useful than the levels of the actual numbers. Hence, the analysis gives preference to the trend of the energy intensity data for each country over the absolute numbers.

In addition, energy intensity data is a reflection of both the efficiency of the economic activities and the structure of the economy. My analysis will give preference to sectoral energy intensity data (i.e. industrial, residential, building, transport, etc.), rather than the overall data for comparison (Fig. 1.4). The former is less affected by the overall economic structure, which is notably different in the two countries throughout the period studied (Fig. 1.5).

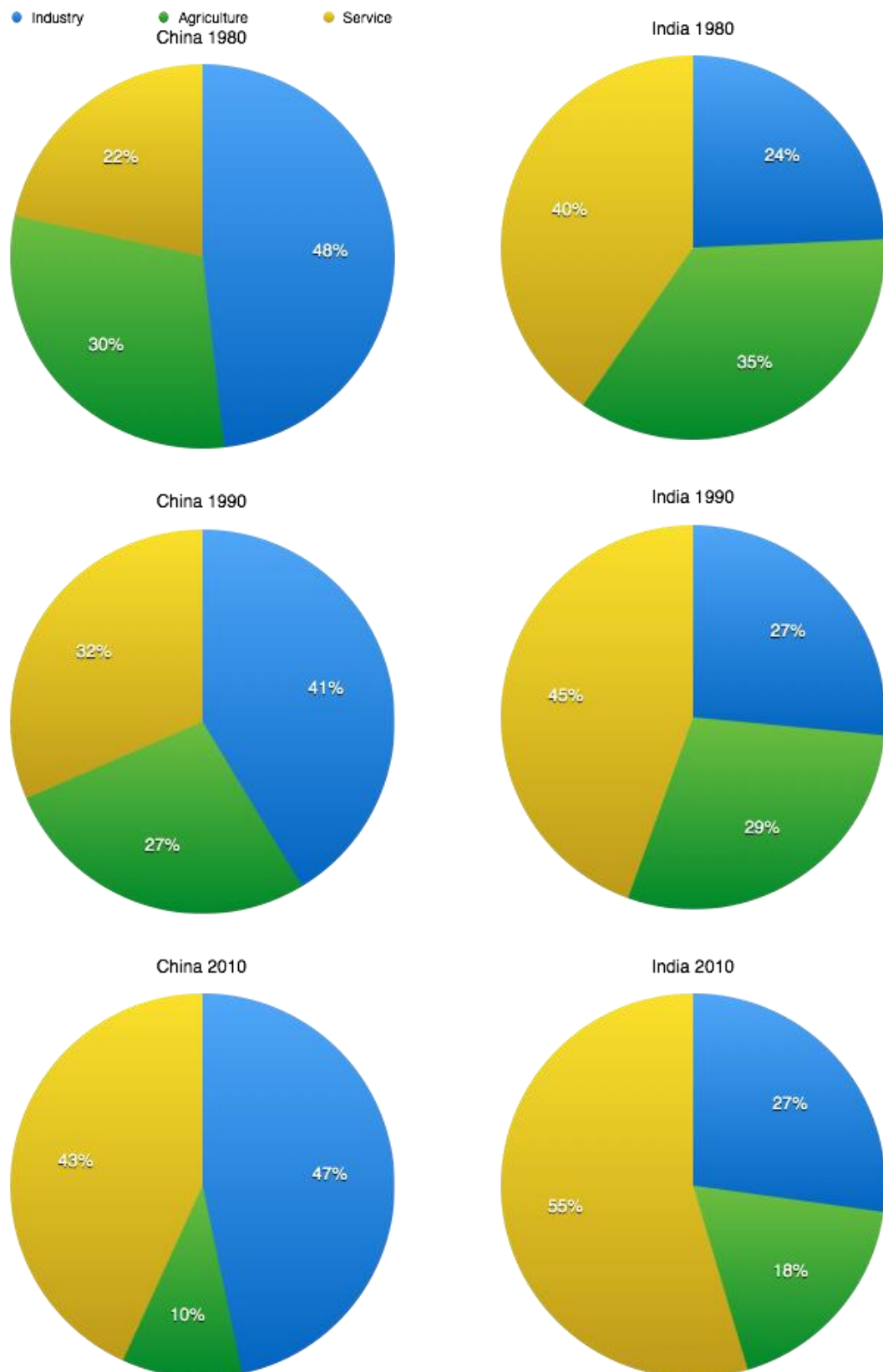
Figure 1.4 Overall Energy Intensity Comparison between China and India (1990-2010)



Note:

1. Data source: World Bank and International Energy Agency (IEA Statistics © OECD/IEA, <http://www.iea.org/stats/index.asp>).
2. Energy intensity level of final energy (MJ/\$2005 PPP): A ratio between final energy consumption and gross domestic product measured at purchasing power parity. Energy intensity is an indication of how much energy is used to produce one unit of economic output. Lower ratio indicates that less energy is used to produce one unit of output.
3. The data was only available for the period of 1990-2010.

Figure 1.5 Economic structures of China and India (1980, 1990, 2010)



Source: World Bank Database

1.5 Method and Data

Since chapter 2 will offer an in-depth discussion of the theoretical framework – and of methodologies²⁰ – this section focuses on the techniques employed for gathering data, and the sources of data. The fieldwork method, field selection and data gathering for the case study of the thesis will be laid out in details in Chapter 6, in order to help readers understand the case study rationale and the results in an integrated way.

1.5.1 Data Collection Tools

In order to build up a rich and detailed analysis of the research topic, the collection and triangulation of qualitative data from multiple sources are required. The result of the analysis is built on 10 months of fieldwork in China and India (June 2013 – April 2014). The fieldwork employed methods of semi-structured interviews with more than 50 policy makers and key stakeholders, and participatory observation with EE, LCD, energy and the environment think tanks, enterprises and local governments.

Semi-structured interviews were conducted with more than 50 government officials, NGO representatives, international organization officials, businessmen, entrepreneurs, academia and think tank staff. Because my project is particularly interested in the interactions of various stakeholders in the process of LCD/EE institutional change, I use the interviewing technique of identifying “interfaces” – the critical nodal points of conjunction and negotiation that shape the institutional, organizational, and policy change process (Shore and Wright, 1997, p.14). Apart from that, I also pay attention to the inaction, disjunctures and dysfunction of, and between, the actors during this process. By doing so, I try to capture as many aspects of the LCD politics as possible.

²⁰ Harding (1987) argued that methodologies are the application of theories in particular field (p.3).

Here, my previous experience in the area of LCD research in both China and India has enabled me to identify the key policy shaping groups – think tanks, research clusters, social clubs, NGOs, journalists and conferences – that are in the centre stage of the LCD “interfaces”, and to gain access to the key persons in this area.

Thanks to my long-term study and collaboration with the Centre for Rural Energy Efficiency at Tsinghua University, this interview strategy worked smoothly during my fieldwork in China. However, my role as a Chinese national investigating India’s policy cohort, had the potential to generate controversies and problems given the mutual distrust of the two countries. Therefore, during my fieldwork in India, I framed my research topic closely with EE policy, and avoided extending the scope of interviews too widely to sensitive areas, such as energy security and international relations. Thanks to EE’s relatively low priority in India’s policy agenda and the technocratic characteristics of the EE policy cohort, I could conduct the stakeholder interviews as thoroughly as possible.

Participant observation was conducted with three influential think tank/research groups in EE/LCD in China and India. These are the Centre for Rural Energy Efficiency in Tsinghua University (July-August, 2013) and the China Center for International Economic Exchanges (June, 2013) in Beijing, and The Energy and Resource Institute (January-April, 2014) in New Delhi. In all three organizations, my role was to be an interning researcher in an EE related policy project or a volunteer in organizing an international conference where EE/LCD was a main theme for high-level policy discussion. The emphasis of participant observation was on the formal and informal interactions of policy stakeholders, the formal and informal norms,

concepts and ideas being practiced by EE/LCD policy stakeholders, and the formal and informal procedures and methods used in policy-oriented EE/LCD research and their implications for the policy process, organizational arrangements and institutional change for EE/LCD.

Non-participatory observations were conducted with different EE/LCD players throughout the 10-month fieldwork. This is an important method involving observation especially of the informal practices and power dynamics of EE/LCD policy, business and everyday life at the local level.

Secondary data has also been collected through extensive archival/library research on energy efficiency governance and performance. The archive based fieldwork was mainly conducted in The Energy and Resource Institute (TERI) Library, the Parliamentary Library and the Nehru Memorial Library in New Delhi. I also acquired the series of publications and research networks from the Climate Policy Center, the Low Carbon Development Research Nexus, and the Center for Building Energy Efficiency of Tsinghua University in Beijing through public access and personal connections. The research has also benefited from various online resources such as the online database of IEA, EIA, LBL, BP, UN and the World Bank, the People's Daily Archive, and the China Legal Documents Online database, etc.

The case study of the thesis builds on longitudinal data for household EE in 12 households in two villages of rural China. The details of the methods can be found in Chapter 6.

1.5.2 Data analysis

I used mixed methods and followed an iterative process in data analysis, involving analytical narrative, process tracing and emergent interactions between data and theoretical debates.

Apart from using the analytical tools that are embodied by the epistemic and theoretical discussions, the main body of the analysis also relies on the method of *Analytical Narrative*: “By reading documents, laboring through archives, interviewing, and surveying the secondary literature, we seek to understand the actor’s preferences, their perceptions, their evaluation of alternatives, the information they process, the expectations they form, the strategies they adopt, and the constraints that limit their actions.” The analysis pays close attention to political economic context, and in the meanwhile, “extract(s) explicit and formal lines of reasoning” (Bates et al., 1996, p. 46).

Process tracing is a fundamental tool of qualitative analysis, which is defined as “the systematic examination of diagnostic evidence selected and analyzed in light of research questions and hypotheses posed by the investigator” (Collier, 2011, p.823). Process tracing focuses on the causal-process observations. It uses careful description as important building block to analyze trajectories of change and causations. It pays close attention to sequences of independent, dependent, and intervening variable, providing strong analytical tools to analyze the nuanced mechanism of EE/LCD in China and India.

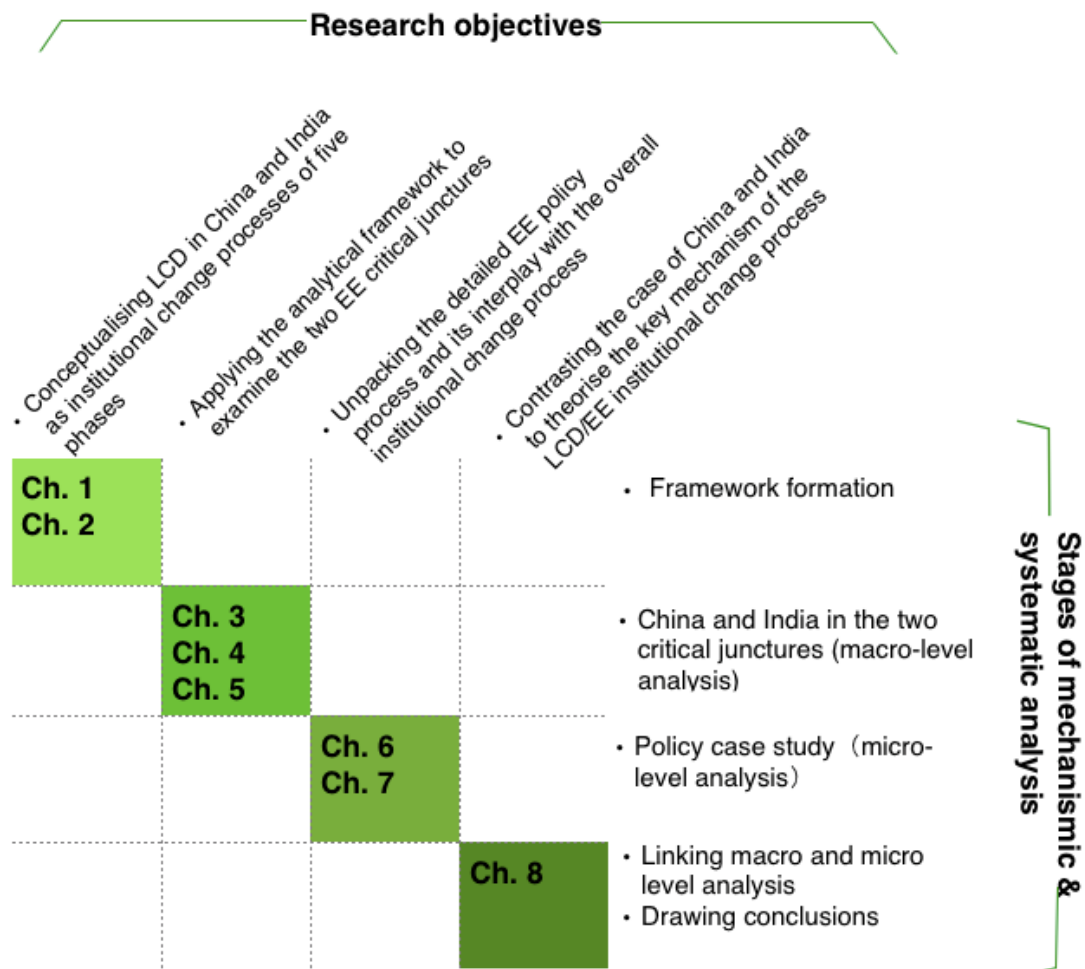
The data analysis and the development of a new theoretical framework have been iterative processes moving between actual data and theoretical debates. I elaborate my theoretical construction in Chapter 2. The analytical exercise in the empirical chapters takes a problem-driven, instead of theory-driven approach. The attempt to theorize the EE institutionalization process in China and India's transitions will be made in Chapter 8.

1.6 Chapter outline

The eight chapters of the thesis are organized to serve the research objective in a systematic and comparative way. The organization is aimed at combining the macro- and micro-level analysis, as well as the theoretical and empirical discussions. To do so, the eight chapters are grouped into four blocks, as shown in Fig. 1.6:

- *In the first block*, the Introduction and Theory chapters lay out the rational, the epistemic and the methodological foundations, as well as construct the analytical framework.
- *In the second block*, the three macro-level empirical chapters map out a comparative landscape of China and India's EE institutional development in the two critical junctures.
- *In the third block*, the two case study chapters add a micro-level viewpoint to the argument of the thesis.
- *In the fourth block*, I synthesize results emerging from the chapters and draw conclusions.

Figure 1.6 The Organizations of chapters



Bearing in mind the thesis structure, I now turn to chapter summaries -

Chapter 2 Theory constructs an analytical framework based on a critical review of both orthodox and heterodox theories in four mega-theoretical clusters: i) institutional change, ii) politics of policy, iii) LCD/environmental policy/governance in China and India, and iv) a multidisciplinary China-India comparison. The analytical framework first identifies two critical junctures of EE institutionalization processes in China and India. It then outlines five critical phases of the LCD institutional change process: 1. Identifying and contextualizing the triggering events, 2. Political conceptualizing of

the policy field for LCD, 3. Establishing LCD organizations within an existing governance structure, 4. Detailed policy process, and 5. Institutionalizing LCD.

Chapter 3 China and India in the First Critical Juncture, using the analytical framework developed in Chapter 2, traces the origins and formations of EE institutions in China and India from 1970s to early 2000s. The analysis unpacks the multi-layered and multi-factor processes. It finds that self-reinforcing institutional between the critical players were formed during the first critical junctures of China and India's EE development. The equilibrium led to the formation of the initial EE institutions in the two countries: in India, EE is believed to be realizable without government subsidies and with weak status for EE governance; in China, EE is realized through the target-implement-penalty mode as long as the EE agenda complies with the economic growth target. The distinct political economy of the Chinese and Indian economic reforms that started in the 1980s provided a rich background that sustained the complex of self-reinforcing path-dependent processes for EE institutions. The chapter therefore argues that the fundamental EE institutions emerging from the first critical juncture have a long-term impact on the EE development of China and India.

Chapter 4 China's second critical juncture focuses on China's EE institutionalization process during the second critical juncture – the 11th FYP (2006-2010). Employing the same analytical framework developed in chapter 2, the chapter analyses how International Climate Change Negotiation (ICCN) and the domestic economic stimulus package in wake of the international financial crisis, one after another created a combined triggering effect to the second critical juncture of EE

institutionalization in China. The chapter then turns to analyse the organizational change for EE development during this period, and argues that the changes were discursive rather than structural. In the end, an argument is developed with field evidence and secondary data that the economic growth agenda underpinned every level of the ambitious EE program and created ways to manipulate policy and evade EE. Hence, despite the massive public capital investment and state determination in favor of EE and LCD, the continual reliance on the economic governance structure of EE during the second critical juncture reinforced, rather than restructured the EE institutions that emerged from the first critical juncture.

Chapter 5 India's second critical juncture investigates the EE institutionalization process of India during the second critical juncture (2008-present). In comparison with China, I analyse how a crucial time difference made the ICCN and the financial crisis form a different kind of triggering event to the second critical juncture in India. I argue that compared with China, the smaller size of the Indian economy and GHG emissions during the early 2000s (in addition to having a much more experienced diplomatic corps in the ICCN), helped India successfully to delay the transfer of ICCN politics into domestic pressure. Meanwhile, the financial crisis had a distinct effect on India's domestic EE development compared to China - due to different timing of events and different government responses (fiscal austerity in India and stimulus in China). Following the same analytical framework, this chapter evaluates the organizational changes of EE in India during that period of time, and argues that there was little organizational change in the EE governance structure, apart from some gradual and survival-oriented changes in the semi-government and non-government sectors. Then the chapter turns to discuss how the organizational and governance

structures affected the development of EE policies and outcomes. The chapter concludes with a brief comparison of China and India's EE institutionalization process from 2006 to the present day.

Chapter 6. Case study background, following the macro level analysis of the EE institutionalization process from the 1970s to the present in India and China, Chapter 6 starts a case study of a specific EE policy scheme – rural energy efficiency in China. The purpose of this case study is to show vividly through the EE policy process the dynamic interactions between the state, local authorities, business, and villagers' everyday lives. This chapter lays down the conceptual and methodological foundation of the case study, and analyses the conceptualization and authorization of rural EE. I argue that in China rural EE was a much broader and sophisticated concept than the international understanding of rural EE. The chapter ends with the details of my fieldwork method, preparing readers for the substantive analysis in the next chapter.

Chapter 7. Case study results, based on the conceptual and methodological foundations elaborated in the previous chapter, and employing Schaffer (1984)'s framework for policy analysis, this chapter maps out a case study of rural EE. It traces the connections between policy processes and the contradictions plaguing rural EE that hamper its success. I then consider the relationships between the multiple critical players affecting EE in rural China. I argue that the bundling of EE with economic policy penetrates every level of the policy process, leading to policy failure in rural Chinese EE.

Chapter 8, Looking for the key mechanism, summarizes the results of the dissertation in order to theorize the dynamics of EE institutionalization processes in fast-growing economies based on the analysis of empirical studies of China and India above. I argue that, despite distinct political and economic contexts, a self-reinforcing process formed between triggering governance structures, organizational changes, actual agencies and individual policies actively shape EE institutions in China and India. In China, the bundling of EE with economic governance is the fundamental mechanism in this process; while in India, the incubation of EE within energy governance has generated the vital characteristics of EE development over the past 40 years. The thesis finishes by highlighting the contributions I make to the relevant literature and pointing towards several avenues for future research.

CHAPTER 2. THEORY

This project is primarily driven by empirical problems – making sense of LCD in contemporary China and India. Yet theories (general systems of ideas which help explain phenomena) provide rich analytical resources with which to systematize this research.

In this chapter, I attempt to establish a comparative framework to analyze the institutional change process of LCD, under the particular political economic context of contemporary China and India from the 1970s to the present day. Theories need evaluating for the capacity to instruct a comparative analysis that addresses *mechanismic, systemic, and political-economic* aspects of the development of institutions for energy efficiency. I propose to do this following three steps: the first discusses the social science paradigms and chooses the harmony-conflict typology to structure my theoretical exploration; the second identifies four clusters of theories that form the building blocks of my theoretical construction (Table 2.1), which are *institutional change, politics of policy, LCD/EE policy of China and India, and comparative methodologies*, with a focus on the China-India comparison. The selection of theories to review has drawn on two rationales: first, to provide a necessarily brief overview of major theories in the field; and second, to identify components of compatible theories that might be helpful for my project. For each of these bodies of theory I discuss both the conflict and harmony paradigms, and critically assess their applicability to my project. I show how each of the theories is useful yet insufficient for the three dimensions of the comparison. In the end, I pinpoint three synthesized theories to be the pillars of my analytical framework.

Based on this theoretical mapping, my third step is to generate a new analytical framework appropriate for my project. The new framework examines LCD institutional change process through five stages: 1. Identifying and contextualizing triggering events, 2. Conceptualizing politically the policy field for LCD, 3. Establishing LCD organizations within an existing governance structure, 4. Detailing the policy process, and 5. Institutionalizing LCD. In order to help the reader understand my framework, I also clarify a few sets of key concepts employed. I conclude the chapter by demonstrating why this framework incorporates most of the key factors needed in a comparative evaluation and contains the potential to capture the crucial mechanisms of LCD institutional development in China and India from a comparative and systematic viewpoint.

Table 2.1 Typology of analytical building blocks

	Conflict paradigm (analytical underpinnings of the theory)	Harmony paradigm	Toward theoretical synthesis (threefold analytical building blocks for the thesis)
Mega-theory clusters			
Institutional change	Marxist Weberian	Neoclassical economics Rational Choice approach	<i>Social Evolution Paradigm (Tang, 2011)</i>
Politics of policy			
	"Governmentality"	Institutional Analysis and Development Framework (Ostrom, 1999)	<i>Policy as practical zones (Schaffer, 1984)</i>
	Discursive Analysis	Its modifications	
Low-carbon policy	(China and India focused)		
	Problem-driven empiricist Investigative reportage	Technocratic (USDOE) Market-centred (IEA)	
China-India Comparison	Non-competitive paradigm (purpose of the research)	General comparative method	
	Bardhan (2010) Harrison and Kostka (2012, 2013) TERI-CAEP/NDRC (2012, 2014)	Mill (1888)	<i>Non-competitive approach (Harriss-White, 2013)</i>

2.1 Reflections on paradigms

A reflection on the typology of social science paradigms is important to my theoretical exercise. Located at the intersection of theoretical clusters to institutional change, the politics of policy, and governance and policy of climate change, LCD, environment and EE, in the specific context of contemporary China and India, this project is confronted by a proliferation of theories from a whole range of social science paradigms. The absence of a successful synthesis of all these various, emerging, and often conflicting paradigms from the perspective of China-India comparison makes the task of selecting and justifying the application of particular theories a unique exercise. As stated in the epistemological concerns (1.3.1), the project is trying to go beyond the factor-focused approach, in order to uncover the crucial mechanisms that structure the interplay of multiple factors/players of LCD in China and India. Yet, without a clear understanding of the foundational paradigms underlying all the fuzzy and messy multidisciplinary mid-level and micro-level theories in the distinct context of China, India and the globe, it is almost impossible to structure the theoretical complexity in a way that makes sense for my comparative project.

As I was puzzled by the problem of effective theoretical systemization, I started to explore widely how social scientists synthesize theories in different fields. Around the same time, the International Studies Association (ISA), the world's leading intellectual community of international studies announced its Annual Best Book

Award to *The Social Evolution of International Politics* by Shiping Tang (2013).²¹ Here, Tang (2013) presents a synthesized analytical framework that incorporates the contending paradigms of International Relations theories to examine the evolution of international politics. This theoretical synthesis is based in turn on his original interpretation of the foundational paradigms of social science that was first published in the journal of *Philosophy of the Social Sciences* in 2010. The paper argued that in social science, theoretical paradigms are based either implicitly or explicitly on distinct ontological and epistemological assumptions about the fundamental mechanisms of human society. Based on that, he laid out four dichotomies/trichotomies as foundational paradigms in social science – i) Materialism and Ideationalism; ii) Individualism and Collectivism; iii) Biological evolutionary determinism, Socialization, and Anti-socialization; and iv) a Conflict paradigm and a Harmony paradigm. This framework provides a useful typology to structure complex social science theories, which is applicable to my project.

Since my project focuses on the institutional change process of LCD, Tang's dichotomy of conflict-harmony paradigms is the most relevant to my theoretical mapping. The **Conflict Paradigm** holds that the most productive way to make sense of human society is to understand the conflicts of interest between different agents, which cause antagonistic behaviour. The representative school based on the conflict paradigm is Marxist sociology, economics and politics, which perceive class conflict as the inexorable and divisive driving force of human history. On the contrary, the **Harmony Paradigm** believes, there is a general harmony of interest, or at least some common interest between different agents, so that cooperation and coordination can

²¹ See ISA website: <http://www.isanet.org/News/ID/4718/Winners-of-ISA-Sponsored-Awards-Announced> [26 July 2015 last assessed].

be achieved. The Harmony Paradigm is represented by the functionalist sociology in which society is theorized as a “big happy family” (Dahrendorf, 1986, p. 176-77) and Neoclassical Economics and New Institutional Economics that sees that, through bargaining, agents can move toward the Pareto frontier for mutual gains despite the existence of conflicting interests.²²

The shortcomings of this dichotomy are clear: the harmony paradigm does not see the fundamental conflict of interest caused by the inevitable resource scarcity in human society, which was articulated by Malthus (1798) as early as the 18th century.²³ The conflict paradigm is able to quite comprehensively address this fundamental scarcity problem, yet it is less capable of explaining cooperation and coordination, especially when it crosses classes. The defects of the dichotomy call for a synthesis that can incorporate both the conflicting and harmonious characteristics of social processes.

In order to map out clear theoretical foundations to the researched topic, I will use a ***Conflict-Harmony-Synthesis*** typology to structure the critical review of general, mid- and micro-level theories in the streams of institutional change, politics of policy, low-carbon/climate change/EE policy and governance, and China-India comparative methodology in the next four sections of this chapter (2.2 – 2.5). Please note, these paradigms of the typology (Table 2.1) are not mutually exclusive at the mid- and micro-levels of theories; rather, consciously or unwittingly, to some extent, they often have synthesized the two extreme paradigms, conflict and harmony, in explicit or inexplicit ways. My theoretical analysis will pay attention to those nuances. In the

²² For example: Coase (1937), Williamson (1985 & 2002), Aoki (2001).

²³ I acknowledge that there is a lot of scholarship, particularly in the post-structuralist tradition, which argues that resources are not as easily quantified as Malthus would suggest and it also depends on how they are defined. However this discussion is beyond the scope of my thesis.

final section, I consider the framework presented in the light of the four epistemological concerns listed in Chapter 1 (1.3), synthesize the four clusters of theories reviewed in Chapter 2 (2.2 - 2.5), and justify the construction of my analytical framework.

2.2 Theories of Institutional Change

Institutional change theory is the backbone of my theoretical construction for three reasons. First, as stated in Chapter 1 (1.1), LCD is in essence an institutional change process, which is focused on changes in the fundamental development rules and norms of human society. Second, for the multi- and inter-disciplinary characteristics of my project, institutional change theory is at the intersection of many social science disciplines. Understanding institutions is a unifying theme among different branches of social science today, including sociology (i.e. Marx, Weber), economics (i.e. New and Old Institutional Economics), comparative politics (i.e. the Historical Comparative Institutional Approach), and international relations (i.e. the Institutionalist approach) (Tang, 2011, p.1). In that way, institutional change theories provide an inclusive field for synthesizing several mid- and micro- level theories drawn from different social science areas. Third, for the comparative purpose of my project, institutional change theories contain vast comparative potential. Changes and stagnation (relatively no change) of LCD, factually and commonly, exist in China and India at every level of government and society, forming a strong base for any kind of comparison.

With proliferating multidisciplinary contributions, institutional change theory has developed into a complicated and sprawling theoretical field. To make sense of this

theoretical complexity, I will first explain both the harmony and conflict paradigms of institutional change theory following a systematic review presented in the book *A General Theory of Institutional Change* by Shiping Tang (2011). After that, I outline the synthesized institutional change theory proposed by Tang (2011), and explain how it can be used for my theoretical exercise.

2.2.1 Harmony – conflict divergence

In brief, according to the “harmony” school of institutional change theories, different agents interact in a way that is spontaneously ordered, ultimately directed towards mutual human gains. In that case, coordination and cooperation are mainstream human institutions. On the contrary, the conflictual approach considers that the struggle of conflicting interests is at the center of human institutions. In other words, institutions need to be understood as generated mainly from the politics of power (Pierson, 2000).

For the harmony approach, the dominant school of ideas has been developed in the New Institutional Economics (NIE) – emerging in turn mainly from neoclassical economics. The two major approaches – the transaction-cost and the collective action or public choice approaches are representative of NIE. In both approaches, institutional change is fundamentally driven by efficiency motivations, so that specific institutional improvements should be made to fix inefficiency problems such as information asymmetry, high transaction costs and market failures. Once institutions are formed, such as the firms that can reduce transaction costs, the establishment of property rights that can protect scarcity, and cooperative norms that can remedy conflicts of interests, they become “self-enforcing equilibria”. Ultimately, those self-

reinforcing equilibria approaching Pareto superiority will enhance the social welfare of all players in the game.²⁴

On the contrary, Karl Marx and Max Weber made the most highly recognized contributions in laying down the foundations of the conflict approach in theories of institutional change. With a core argument centered around the struggle between conflicts of interest, this approach differs from the harmony approach in that social systems can not possibly be a product of a rational design to realize mutual benefits. Institutions are created by powerful groups, in order to make sure that those powerful groups can continuously benefit from the institutions and maintain the power structure of the society. In other words, compared to the harmonious utopia in which as long as everybody plays by the rules, everyone benefits, the conflict approach believes that the power holders (the rule makers) benefit the most by making use of the “game”.²⁵

2.2.2 Toward synthesis

Both harmony and conflict approaches have captured some of the crucial mechanisms of institutional change. But they have been accused of also missing some other equally important components.

The inherent shortcoming of the harmony approach is the neglect of the conflicting interests and the power struggle caused by this conflict. By putting conflict and power as exogenous factors, the harmony approach can only explain very limited institutional changes where power was not underlying the agents’ rational choices and negotiations. This inadequacy has been challenged from within NIE, for instance,

²⁴ For detailed analysis of the variants of the harmony approach, such as the functionalism, the Austrian school and neoclassical economics, refer to Tang (2011, p. 12-20).

²⁵ A nuanced analysis of the conflict approach, refer to Tang (2011, p. 20-22).

Acemoglu et al. (2005) argued that, in addition to the institutions that are formed by cooperation and coordination, some crucial institutions are initially imposed, and then sustained by, the power held by the ruling groups. In addition, Acemoglu and Robinson (2012) made the distinction between extractive and inclusive institutions that were the result of the constant conflict and negotiation between the ruler and the ruled.

Contrary to the harmony approach, the conflict approach is centered around power politics. Marxism states that struggles among different classes is the main force of social progress, while Weberian theories also emphasize the role of power in imposing institutions in society regardless of the will of some or many of the agents. Yet, if every agent or group/class of agents is concerned merely in their own interests and pursues its exclusive interests by exploiting or controlling others through power politics, how do we explain the existence of welfare enhancement progressed by institutions, including the apparent raised awareness of and funds for international humanitarian aid, climate change and LCD? How do we explain that some ideas that eventually benefit human welfare in the long term have been adopted during the constant power struggle and some good institutions are formed consequently?

The deficiencies of the harmony and conflict approaches in institutional change theories call for synthesis. Many theorists have attempted to do so, such as Lenski (1966), Kingdon (1995), Lieberman (2002), Weir (1992) and Garland (1990). Among them, Tang (2011) marks the latest development of a general theory of institutional change. This framework is constituted by five distinctive phases:

1. Generation of ideas for specific institutional arrangements

2. Political mobilizations
3. The struggle for power to design and dictate specific institutional arrangement
4. The setting of the rules
5. Legitimization, stabilization, and reproduction

The first phase is to generate new ideas for a specific institutional establishment, which can take place in the forms of technological breakthrough, social learning, cross-cultural communications and significant advances in scholarship, etc. This is followed by political mobilizations to support a particular idea for an intended institutional change. With the mobilized resources, agents struggle for power to make the rules for institutionalizing the selected idea. Following the conflictual phases (2 and 3) is the actual setting of the rules, which is led by the winning group from the power struggle. So the process will mostly benefit the winning side. After the institutional arrangements are in place, the last phase is to consolidate the institutional arrangements using various forms of legitimization, stabilization and reproduction. Thus, a single cycle of institutional change is seen as complete.

2.2.3 Critique

Drawing from the theories of institutional change discussed above, I now consider key questions that arise from this discussion that may be crucial to my project. I have discussed how different approaches of institutional change theories have addressed the manifold human interactions, ranging from coordination, cooperation, competition, power politics, to generation, selection and consolidation of new ideas. A powerful institutional change theory should be able to address the rich complexity of the mechanisms of institutionalization process. I consider that Tang (2011)'s five phases of institutional change is among the most integrated and synthesized approaches

available for my project. Hence it is chosen as one foundational pillar of my theoretical building.

One potential critique is that the Tang theory is a grand and general theory of institutional change, which was built from broad literature of social science, then is it appropriate for the specificities of LCD?

Answering the question, I argue, a grand and general theory is not only useful but also necessary for the specific theoretical exercise of my project, because LCD in China and India are open-system phenomena.²⁶ Therefore, micro- and mid-level theories need nesting in general framework to be comprehensive. Then applying general framework does not necessarily exclude small but valuable theories. On the contrary, a general theory as the backbone of theoretical construction enables me to integrate even more widely and freely, the multidisciplinary theories relevant to my project.

Built on the backbone of a synthesized general theory of institutional change, the policy theories, LCD theories, and China-India comparative methodologies will act as the other set of pillars of my theoretical building. The following three sections elaborate that.

2.3 Theories of Policy

In this section, I present the harmony and the conflict paradigms of policy theories that are relevant to my research topic. The harmony paradigm treats policy in an objectivist framework, which was developed based on industrial countries' policy

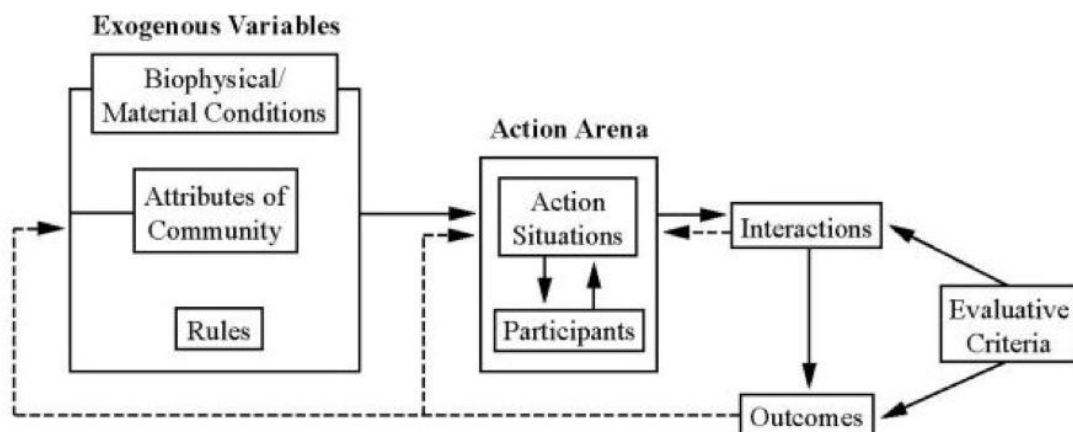
²⁶ See footnote 10 for the definition of “open-system phenomenon”.

practice and has been applied in the developing countries. I critically review Ostrom (1999)'s Institutional Analysis and Development Framework (IAD) as an example of this paradigm, and explain why it has limited application to my research area. The conflict paradigm looks beyond the objectivity of policy, and tries to capture the manifold subjectivities and conflicts imposed by the policy stakeholders, especially the powerful policy cohort. I critically review the Foucauldian concept of "governmentality" and the policy discourse analysis as representative of this paradigm. I conclude the section with a brief critique and lay down foundations for the discussion of the next section.

2.3.1 Institutional Analysis and Development Framework (IAD)

The rational choice approach is situated in the mainstream of policy analysis. It examines policy as multi-layered rational choices made by stakeholders that are structured by the given institutional context. Ostrom is the key theorist developing this framework. This sub-section provides a critical review of IAD that were developed by Ostrom and her colleagues.

Figure 2.1 The IAD Framework

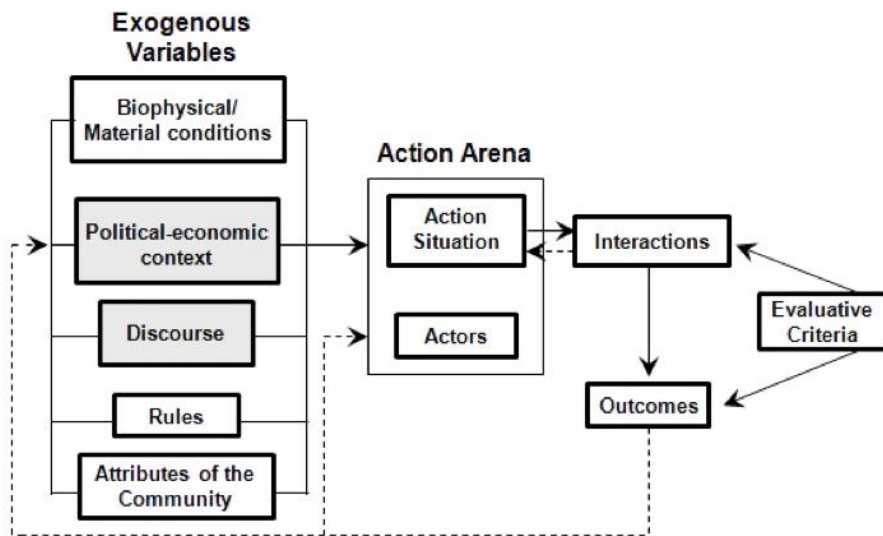


Source: Ostrom, Gardner and Walker 1994, p37

Ostrom (1999) used the above figure to explain the IAD framework. For any policy reform, the first step is to identify an Action Arena which is determined by the institutional settings that are constituted by exogenous variables, including material conditions, attributes of community and rules-in-use. The action arena forms a conceptual unit for policies to form and function. The action arena is influenced by the range of working rules (*action situations*) and the resources, values and information the *participants* bring in and take from. All the participants are “rational economic men” who maximize their interests based on full information and well-ordered preferences about *incentives*. The *outcomes* within this framework are determined by patterns of interaction that can be evaluated according to: economic efficiency, fiscal rationality, redistributive equity, accountability, conformity to general morality and adaptability (to the changing external environment). This process can be self-reinforcing because the outcomes may re-affect the exogenous variables and the action areas.

Compared with the policy doctrines that treat policy as scientific “surgeries” for an actual problem, this framework captures more nuanced realities and interactions of the policy process. However, situated in the harmony paradigm of institutional and policy analysis, IAD does not pay enough attention to “the interplay of power, the positioning of various actors within nested hierarchies and the role of context all exert a powerful influence” (Armitage, 2008, p. 24). Clement (2010) adds the elements of *political-economic context* and *discourse* into the exogenous variables of the IAD framework (fig. 2.2), drawing attention to the significance of the embeddedness of individuals, groups, and systems of policy process in the area of resource governance.

Figure 2.2 The politicized IAD framework



Source: Clement (2010)

Later on, Ostrom and her colleagues also modified the IAD framework by problematizing the material conditions of exogenous variables, in order to develop a more complex framework for analyzing social-ecological systems (SES) (Ostrom, 2011). But the modifications do not effectively remedy the defects of the harmony paradigm that neglects the power struggle of the interplay between policy stakeholders. Clement (2010) makes a significant contribution by bringing political economy into IAD, yet more nuanced analysis are required for unpacking the politics of policy in environmental and low-carbon policies of developing countries.

2.3.2 Conflict paradigm in policy theories

In this sub-section, I outline two theoretical approaches to policy in the conflict paradigm. The first is the Foucauldian approach to policy as “governmentality”; the second is the approach to policy through policy language and discourse. I conclude the section with critique and reflection on the analytical components that I find useful yet in some degree limiting for my project.

Foucault's "governmentality" constructs a powerful critique of the harmony paradigm of policy theories, because it construes the idea that the neo-liberal and rational choice approach "as a political project that endeavors to create a social reality that it suggests already exists" (Lemke, 2002, P.13). Foucault describes "governmentality" as a "specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy, and as its essential technical means, apparatuses of security" (Foucault, 1979, p. 102). His concept of governmentality emerged from historical reconstructions of a period starting from Ancient Greece to the modern neo-liberal era (Foucault, 1979, p. 67). He documented the shift of the construct from that of a modern sovereign state as constituted by the government of a population to the construct of the administration of a physically bounded territory in mid-Eighteenth century Europe. "Governmentality" is recognized to have played a decisive role in Foucault's analytics of power in several aspects: "it offers a view on power beyond a perspective that centers either on consensus or on violence; it links technologies of the self with technologies of domination, the constitution of the subject to the formation of the state; finally, it helps to differentiate between power and domination" (Lemke, 2002, p.3).

The concept of "governmentality" also challenges the harmony paradigm of policy theories by pointing out how neo-liberal rationality functions as a "politics of truth" that actually produces new forms of knowledge, inventing new notions, concepts and domains for power exercise through policies. Lemke (2002) used the example of the discourse on "sustainable development" to elaborate this argument:

In an age of 'sustainable development', previously untapped areas being opened in the interests of capitalization and chances for commercial

exploitation. Nature and life itself are being drawn into the economic discourse of efficient resource management. (p.8)

Apart from “governmentality”, the analysis of discourse is another important school within the conflict paradigm of policy theories. This school brings critical attention to the role of language in which the choice of words, concepts, symbols, labels, keywords, stylistic devices and arguments operated to frame, legitimate, and/or contest policy, as necessary channels to understand policies (Bacchi 1999, Wood 1985, Apthorpe and Gasper 1996). Policies are framed through a particular reading of the problem to be addressed, and are legitimized using rationalized and depoliticized languages in various policy processes. This is a useful tool to analyze the language of China and India’s low-carbon and EE policies.

2.3.3 Critique

Compared with the harmony paradigm of policy theories, the Foucauldian and Discursive methods bring attention to the much more nuanced realities of policy politics. They consider the policy “technologies” that are treated as objective means to realize policy “outcomes” in the harmony paradigm as sophisticatedly and intentionally framed political tools used by the powerful groups for certain political goals in a society. The conflict paradigm can more powerfully explain the various manipulations of LCD in China and India that the harmony paradigm fails to address. Nevertheless, for my theoretical construction, the Foucauldian and Discourse analysis do not cover the whole chain of interconnected policy and the institutional change processes and material practices. This is not to say that the tools of these approaches are not relevant to my analysis. In the following section, I bring the mid- and micro-level theories of LCD/EE, environmental and climate policies/governance of China

and India together, to discuss the appropriate policy and governance framework for my institutional theory-building.

2.4 Theories of LCD policies

In this section, I first critically review the technocratic policy doctrines of LCD. Then I move on to outline the important discussions on China and India's environmental policies situated in the conflict paradigm. Based on critiques of both the schools, I introduce Schaffer (1984) and Harriss-White (2002) who develop a theory that perceives policy as zones of political practices. I argue that this is the most applicable policy theory for the analytical framework of my researched topic.

2.4.1 Technocratic and Market-centered Approach

The technocratic approach of LCD treats policies, governance and institutional change processes of sustainability/LCD as a standard formula consisting of several steps and the coordination of these separate arenas of policy processes.

A typical example is the framework for the “five steps towards institutional change process for sustainability” developed by the Office of Energy Efficiency & Renewable Energy of the Department of Energy in the U.S (Fig.2.5). This framework claims that to establish institutional change in a Federal agency to achieve sustainability or other EE goals, simply following the five-step institutional change process would be sufficient. The five steps are:

Step 1. Determine Goals – defining the agency's sustainability goals, decide what outcomes are desired over what period of time.

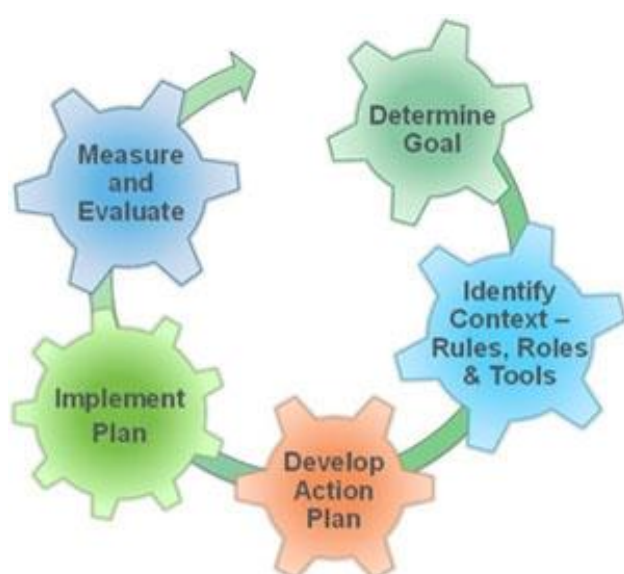
Step 2. Identify Rules, Roles, and Tools – analyzing the context within which the identified goals are to be achieved. This process starts with identifying the organizational rules, roles and tools that shape the current context and followed by identifying the linkages of them that are crucial for successful implementation.

Step 3. Develop an Action Plan – based on the first two steps, develop an action plan that targets specific audiences with tailored strategies and appropriate metrics and regular measurements that accommodate with its long-term visions.

Step 4. Implement an Action Plan – implement the action plan taking into consideration of the organizational context.

Step 5. Measure and Evaluate – measure and evaluate the outcomes of the actions, adjust actions and goals if necessary.²⁷

Figure 2.3 USDOE Five-Step Institutional Change Continuous Improvement Cycle for Sustainability



Source: USDOE website.

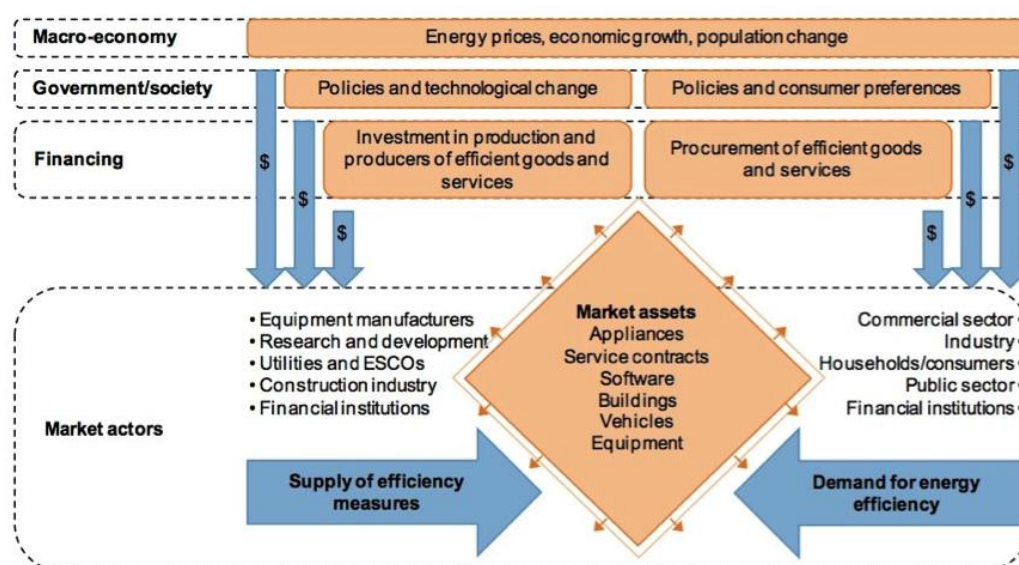
This five-step institutional change formula was developed around 2010-11 to induce sustainable changes within the U.S. Federal agencies. Despite its implementation scale is limited to certain highly organized agencies, it highlights the dominating linear policy logic that is widely accepted by government agencies worldwide. The fundamental problem of such linear logic lies in its treatment of the institutional change process towards sustainability as an objective and scientific procedure that

²⁷ See the USDOE official website. Available: <http://energy.gov/eere/femp/institutional-change-process-sustainability> [25 July 2015 last assessed].

does not involve any form of politics. This logic is especially popular in the area of LCD and EE, because people tend to think that technologies and science are the major solutions to the problem. As long as policies and/or actions plans are well designed, implemented and evaluated, the goal of sustainability would be realized.

International agencies dedicated to LCD and EE themselves realize the defects of the linear or circular technologies-focused model. In order to materialize the model and make it “marketable” to different stakeholders, especially to governments and business groups, a sophisticated market-centered model has been developed. Fig.2.4 shows the latest IEA matrix for EE markets. In this complicated matrix, market factors are situated in the center. Macro economic, government, social and financial bodies are placed in supporting roles to provide finance in order to make the EE market work. By boosting the market, a well-functioning market would promise returns to investors. The main mechanism of this proposed institutional complexity is effective markets. This argument resonates strongly with the neo-liberalist approach in institutional and policy studies.

Figure 2.4 Market-centred model for energy efficiency



Note: ESCO = energy service company.

Source: Inserted from IEA (2014, p17), to show the market-centred institutional complex of the current multi-sector EE governance analysis.

The technocratic approach towards LCD can be represented by a simplified model for the purpose of making it workable and marketable for emulating and scaling up. But it neglects the real functions of LCD politics, making it almost impossible for countries, both the developed and the developing, to implement it in the highly politicized reality. In recent years, some research has made efforts to bring politicized institutional analysis into the EE governance literature. For example, Taylor (2008) incorporated the dimension of the institutional environment that governed EE market transactions into the model of EE financing in China, India and Brazil. Andrews-Speed (2012) scrutinized the institutional foundations of the socio-technical transition for low carbon energy governance in China, and Rosenow (2013) and Howarth and Rosenow (2014) discussed the evolution of decision-making institutions of individual energy consumers in the UK and Germany's EE policy process. Those studies provide inspiration and useful tools for my theoretical and empirical study. Yet, they have not fully transcended the harmony paradigm that prioritizes policy as a rationalized social

engineering process. So they still lack the power to fully address the multi-nested conflicts of interest and power politics in an explicit and systematic way.

2.4.2 Conflict paradigm

Comparing to the technocratic approach of LCD who attempts to provide a holistic guidance of LCD/EE policies, governance and institutional change in one framework, the conflict paradigm is largely constituted by a series of mid- and micro- level theories based on fieldwork researches of anthropologists, sociologists, political economists, geographers and scholars in other social science disciplinary fields plus investigative journalists in different countries. In this section, I bring together studies on environmental and low-carbon policies of China and India that pay attention to the “conflict characteristics” of policy process relevant to my researched topic. I then question their limits in explaining the crucial questions of my researched topic.

One set of research on developing countries’ environmental and low-carbon policies is centered on the conflicts between policy-making and implementation. The general conclusion emerging from such scholarship is that “bad” implementation distorts and limits the impact of good policies. In the context of contemporary China, which enjoys *de facto* economic decentralization to a large extent (Xu, 2011), local governments’ manipulation of central policies are often blamed. Evidence for this includes the immense fraud on environment and energy related data (Andrews-Speed, 2009), central-local tensions over economic interests and environmental protection (Moore, 2014a), collusion between local officials and polluting factories against pollution penalty (Lora-Wainwright et al., 2012), lack of integration and coordination between multiple actors in regulation and law enforcement (Van Rooij and Lo, 2010), subordination of public engagement in policy implementation of environmental

legislations (van Rooij, 2006), government control over green journalism and reportage (Geall and Hilton, 2013), as well as the frequent transfer of local environmental cadres that favors coporating with the short-term economic growth agenda than the long-term sustainability (Eaton and Kostka, 2014).²⁸ But, as Moore (2014b) argued, those accusations blaming improper *implementation* can also be interpreted as the central government's "deliberate and largely successful strategy of protecting itself from environmental fallout by skillfully deflecting blame toward protectionist local officials and state-owned enterprises... (in order) to protect its authority and enhance its power".²⁹ The 'bad implementation' school is handicapped in telling the complicated story of the policymaking process. It does not address the crucial question of *why* policy makers keep on ignoring this constant "bad implementation" in their monitoring, and in their development of new policy. A more integrated analytical framework is needed.

In China, several scholars have made efforts to explain low carbon policy institutions that attempt to bridge the dichotomy. In 2011 and 2013, Qi mapped out the nuanced mechanism of the Energy Conservation Target Responsibility System (ECTRS) that bonds local cadres' political promotion with their performance in meeting the centrally-set EE target. Qi argued that ECTRS was the fundamental institution for China's impressive EE realization - 19.1% reduction of energy intensity during the 11th FYP. Harrison and Kostka's (2014) study of EE policy in China and India however, argued that balancing the competing development priorities and aligning multiple interest groups through a "interest bundling strategy" during the policy

²⁸ I do not attempt to include all of the relevant studies. The cited are only a few latest and representative studies that are available in English.

²⁹ [Online] Available: <https://www.foreignaffairs.com/articles/china/2014-06-10/pollution-without-revolution> [25 July 2015 last assessed].

process is the key to China's successful carbon mitigation policy. Both studies pointed out that the state has played a central role by creating a support base for EE. They concluded that this mechanism has proved effective. Finally, Ahlers and Schubert's (2014) investigation of China's "Building a New Socialist Countryside" policy further resonated with Harrison and Kostka's argument. Indeed, if one does not judge whether the actual policy result is good or bad, and only looks at whether the policy achieved its goals (effectiveness), the Chinese political system's adaptability and stability are indeed successful, and have led to successful policy outcomes.

The argument raised from the "effective mechanism" school seems to be in opposition to the "bad implementation" school. This confrontation is rooted in their different focus and approach, and both have their limitations. The former does not pay enough attention to the immense negative effects caused by the mechanism that drives local governments to meet the centrally set targets at any cost; the latter fills this gap well, but fails to further ask the question: Why can such bad implantation be sustained, and to some extent, borne, by policy makers? The "blame game" school attempted to answer it, yet it cannot sufficiently respond to what the "effective mechanism" school asked: why such mechanism approved successful in this complex society going through radical transformations?

In the Indian context, the conceptual dichotomy between policy-making and implementation is as influential as it is in China. Given India's different political system - democracy and a vibrant civil society - the narrative of India resembles more "the government/state versus the people", than China's "the central government versus the local governments". For example, Fisher (2014) argued that despite of

India's energetic and emerging climate NGOs at the grassroots level, the government has not effectively integrated their voices and political energies into policy making and implementation. In that way, grassroots NGOs who to a large extent represent the people's voice are marginalized by the climate policy landscape in New Delhi, which is basically constituted by central government agencies, foreign donors and national think tanks. Charnoz and Swain (2012) argue that the government's slow implementation as well as the low priority for EE compared to solar energy technologies remain major obstacles to the realization of India's EE potentials. *Down to Earth*, the flagship magazine published by the leading Indian environmental advocacy Centre for Science and Environment (CSE) has also dedicated a series of in-depth investigative reports on environmental and renewable energy scandals. These unveil the massive cronyism and corruption between the government and business that exploit the public good.³⁰ Besides this, the subordination of the minority groups in evolving forest conservation and natural resources policies were also well explored by a group of international scholars (Agrawal and Ribot, 2000, Vira and Kontoleon, 2010). One of them, Ghotge (2015), from the Marxist theoretical point of view, argued that the "green capitalism", which was created and promoted by the government and capitalists under the euphemism of a Green New Deal, purposely ignored the logic of growth and accumulation and the historical relations between materials, energy and labor under the capitalism in India's context. By doing so, the massive changes in the structure of production and social relations that would be required for a successful low-carbon transition are avoided in the policy agenda.

³⁰ For example, its series of solar scandal: <http://www.downtoearth.org.in/content/truth-about-solar-mission> [last assessed 23 June 2015].

All of these bodies of research greatly contribute to our understanding about the conflicting nature of LCD and environmental policies in China and India by mapping out the factual details of local and central-local politics between ranges of stakeholders. The theoretical framing of these empirical accounts are crucially valued for my research topic. Nevertheless, for building a synthesized and political-economic theory of the key mechanism of LCD in China and India, a more inclusive and general theory of policy politics is needed. With these thoughts in mind, I proceed to the next section.

2.4.3 Towards Synthesis: policy as zones of political practices

The most well-synthesized and powerful theory for policy politics today remains Bernard Schaffer's (1984). Schaffer argues that policy makers and implementers tend to create "escape hatches" to evade responsibility for the outcomes of their policy practices in several separate yet overlapping arenas. By doing so, he went beyond the dichotomy of policymaking and implementation, and beyond that of policymakers and policy receivers as well. He argues that these dichotomies obscure the contingent zones of policy practice: *authorization, establishment and allocation*. The dichotomy also confuses the many *escape hatches* that are deployed by the powerful policy groups to evade responsibilities.

The zone of *authorization* sets the agenda, whereby the structure of agenda is formed, and the policy decisions and statements about themes, sectors, agendas and "target groups" are construed as necessary. The ways of evading responsibility include hiding behind the "collective" decision-making, claiming subordination by the "superior orders" and/or "lack of information" in a hierarchical organizational structure, and blaming implementation for the failure of solutions.

This is followed by the zone of establishment, whereby laws and procedures are formed by bureaucratic organizations. The bureaucrats tend to evade responsibilities in the following two ways: first, by introducing sectoralism, the bureaucrats create new departments to “hive off” responsibilities for policy agendas and pass the responsibilities onto sectoral experts in the name of respecting expertise. Second, the bureaucracy creates a wide range of formal and informal rules, procedures, labels and languages to protect themselves from liability for policy failures.

The third zone is *resource allocation*, which the state must rely on to proceed with any kind of developmental project. Schaffer argues that policies are premised on institutional scarcity, which legitimizes the necessity for resource redistribution. According to Schaffer, the institutional scarcity is more of a “myth” than a reality. The “myth of scarcity” nonetheless continues to induce conflicts. The institutional scarcity also creates evade hatches of what Harriss-White (2005) calls *Access*, which refers to the politics of contact, involving the specification of eligibility, counter, queuing, exit options and the deployment of voices.

According to Schaffer, the manifold “escape hatches” lie within and between the zones of policy practices, providing excuses for policy failure. So looking for policy alternatives must first of all involve shutting down those possible “hiving hatches”. From there, proper responsibilities should be effectively imposed.

Schaffer’s framework of zones of policy practice well combined the holistic package attempted by the harmony paradigm and the nuanced political economic analysis

developed by the conflict paradigm. It acknowledges the Foucauldian concept of “governmentality”, integrates the discursive analysis and bridges the dichotomy of policymaking and implementation. In this way, it represents a synthesized framework of the policy theories that is applicable for my research topic. This is not to say that the Shafferian framework is perfect. It does not pay enough attention to the manifold path-dependences of the policy institutional environment that formed through the history and their dynamic interactions with the current policy processes. In other words, the Shafferian framework has well addressed the dimension of political economy of policy, yet the dimension of time needs to be added into it. In fact, I intend to use Shaffer as the other pillar of my theoretical building along with the Tang theory of institutional change for an original theoretical exercise in my specific EE research area.

2.5 Theories of China-India comparison

My project is also located in the emerging literature of China-India comparative studies. I stated in the epistemological concerns of the Introduction chapter (1.3.3), comparative study is necessary for my research topic, because the mechanisms emerging from a single-case study needs to be tested comparatively. This is a common methodology in some social science disciplines, especially in comparative politics and sociology. However, China-India comparison poses many challenges to the commonplace comparative theories in social science.

2.5.1 Orthodoxy in comparative theory

The most widely borrowed comparative theory in social science, especially for constructing comparative studies in political science and sociology is John Stuart Mill’s Two Methods of Comparison (1888). The first is the *Method of Agreement*,

that “if two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstances in which alone all the instances agree, is the cause (or effect) of the given phenomenon”. In other words, the Method of Agreement compares *the most different systems*, where all the factors except one of each system are different, but the result turns out to be the same. Then this factor is identified as the crucial factor towards the result. The second comparative principle in Mill is the *Method of Difference*, that “if an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former; the circumstance in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon.” Basically, this method compares *the most similar systems* with only one factor of each system differs from one another that lead to different outcomes. In that case, this factor is identified as the critical cause factor of the result.

The Mill method is considered to be the first systematic formulation of the modern comparative method and remains influential even today. But Mill himself thought his methods of difference and the concomitant variations was not applicable in social science because the restrictive kind of comparative cases could not possibly be found. Although people rejected this comment for the reason of Mill being over demanding in his scientific standards, it is very relevant for the case of China-India comparisons. As Harriss-White (2014) argued, China and India represent structurally different economies, political systems, labour forces, demographics and material environments yet retain many similarities at the same time (Table 2.2). The mixed picture of different structures and similar challenges does not fit in either of Mill’s two methods.

Comparative theories for the China-India case require thinking and paradigms beyond Mill.

2.5.2 Paradigms of China-India comparison

Despite the fact that multi- and inter-disciplinary China-India comparisons are emerging in both the academic and policy landscapes, theories of China-India comparative methodologies have not developed on the same scale. The most comprehensive and useful theoretical discussion of China-India comparison today remains Harriss-White's British Association of South Asian Studies Annual Lecture at LSE in London (Harriss-White, 2013).

Harriss-White titled the speech "Comparisons are odious!" as she quotes John Lydgate in 1440 AD writing in a "Debate between the Horse, the Goose and the Sheep" on their military value to man: "Odious of old have been comparisons. And of comparisons engendered is hatred". She argues that the reasons for the "hatred" generated from comparison are rooted in the "competition" intention of the entities compared, like China and India. This kind of "competitive comparison" in her words would: 1. Make the loser hate the winner; 2. the ambiguity of comparative criteria make the audience hate the judgments; and 3. impose lessons and implications of the winner for the loser. Despite of the not very positive energy stemmed from the "competitive comparison", it has been a dominating paradigm especially in the political and economic fields. Harriss-White then mapped out four approaches of the competitive comparisons between China and India, which are:

1. Assessing the lags of the Chinese and Indian cases based on a commonly orthodox ends and means;

2. Assessing the different means/pathways of China and India towards a common end;
3. Assessing the deviations of the Chinese and Indian cases against a common model;
4. Generalizing evidences from China, India and other developing countries.

Harriss-White criticizes the competitive paradigm for hindering the more nuanced complexity and importance of time, space and society of China and India in comparison. She also points out that the case of China and India represent differences in both ends and means, which do not fit into any of the four competitive approaches. They are structurally different in both the supply and the demand side of the economy such that they do not satisfy conditions for the competitive comparison (Harriss-White, 2014). More importantly, she criticizes the neglect of politics in the popular competitive comparison especially in the body of economic studies. Based on the critiques, Harriss-White suggests the paradigm of non-competitive comparison.

Instead of proposing a detailed theoretical framework of the non-competitive China-India comparison, Harriss-White quotes Lawson (2003) to say that “there is no theory of everything” and that given the emergent and diverse characteristics of the field, an honest attitude towards the reality, a search for rigorous methodology and the respect for academic democracy should be the principled grounds for the unavoidable pluralism of China-India comparisons (Harriss-White, 2013). I fully agree and adopt this argument in my thesis.

2.5.3 China-India comparison in LCD

Since 2010, in the area of LCD and environmental policy studies, some serious academic and policy efforts situated in the non-competitive paradigm of China-India comparison have been made by international, Chinese and Indian researchers. This section critically reviews three types of researches in this emerging field and discusses their relevance to my project.

Recently emerging scholarship comparing China and India in LCD started with Pranab Bardhan's chapter on "Environment: The Alarming Signs" of *Awakening Giants, Feet of Clay: Assessing the Economic Rise of China and India* (2010). Since the book was for general audiences as well as for academics, the comparative framework was largely framed by the implications of China and India's different political and economic structure towards similar environmental problems. He draws the conclusion that India's democratic system might give it some advantage over China's autocracy facing environmental challenges, while his previous chapters on infrastructure, capitalism and poverty show China's clear advantage over India. Yet it does not mean that India has an easier task compared to China.

In 2012, Harrison and Kostka, two European development experts who focus on India and China respectively, published their in-depth collaborative research on China and India's climate and EE policies as a research paper published by the *Development Leadership Program (DLP)* at the University of Birmingham. They argue that the differences between China and India's climate and EE policy may be encapsulated in the State-signaling mode (of China) and the Market-plus mode (of India). Although the research paper (2012) itself did not touch much on comparative theories, their policy incentive focused approach shows an intense thought-process within the rigor

of a comparative framework. They were clearly making efforts to look for some common mechanisms under the surface of different climate policy paradigms between China and India. In 2013, they further developed the idea of “policy bundling” as the crucial policy mechanism of China and India’s climate policy. My critique of their comparative framework is the lack of consideration of historical and institutional path-dependences, which will be elaborated in my empirical chapters. Nonetheless, their 2013 paper set a very high standard of rigour in China-India comparison in LCD for peer researchers.

Parallel to those academic endeavors, governments and think tanks in China and India also play very active roles in the proliferation of China-India comparative studies in the LCD field. As early as 1986, The Energy and Resource Institute (TERI) in New Delhi initiated a collaborative research with Tsinghua University in Beijing on China and India’s EE problems.³¹ In 2011, another joint study on environment and the development of China and India between TERI and Chinese Academy of Environmental Planning (CAEP), an official think tank of China’s Ministry of Environmental Protection was published. Most recently, starting in 2012, with funding from UNDP and several Indian and Chinese foundations and organizations, TERI and China’s National Development and Reform Commission (NDRC) organized another collaborative research on LCD in China and India. An advanced version of the report was published in 2014.³² High-level dialogues and other research outreach activities are still ongoing at the time of submission of this thesis.

³¹ According to Dr. R K Pachauri’s interview in April 2014, TERI, New Delhi.

³² See the official website of the project: <http://www.teriin.org/projects/loci/>

Due to the policy-driven, knowledge-sharing, stakeholder-engagement and political-exchanges-oriented characteristics of the government and think tanks' initiatives in China and India's LCD, comparative theories are not given high priority attention. Instead, such joint studies focus on the commonalities of the problem and the lessons each country can learn from the other's practice in several sub-themes (Fig. 2.5). The mode of comparison basically follows these stages: 1. stakeholder meetings to identify common key issues of the two countries; 2. writing reports on those issues by the Chinese team and the Indian team respectively and submitting to the coordinator, 3. another round of stakeholders and high-level meetings to discuss the advance publications combining reports from both countries. 4. a final joint report will be released.³³ Since such joint studies bring together top experts of LCD from both countries, the results outline cutting-edge and trendy studies of each country in respective sub-themes of LCD. More importantly, the project embodies crucial political messages on China-India collaborations in LCD, though still in an early stage, representing a critical category of China-India track two diplomacy on this front.

³³ Based on interviews with the coordinator of the two programs, Ms. Shailly Kedia in March 2014, TERI, New Delhi.

Figure 2.5 Project outline and methodology of TERI-CAEP joint study on China and India's Environment and Development



Source: CAEP-TERI. 2011. Environment and Development: China and India. Joint study by CAEP and TERI, commissioned by China Council for International Cooperation on Environment and Development (CCIED) and India Council for Sustainable Development (ICSD). New Delhi: TERI Press. P. viii.

The three works reviewed in this section signify several chronological yet overlapping development stages of China-India comparison based on a summary of Harriss-White (2014b). Both Bardhan (2010) and Harrison and Kostka (2013) are situated in between of the second stage of identifying similarities and looking for the structure of the similarity. Kostka and Harrison (2012) and TERI and Chinese governments' collaborative studies are located in between of the third stage that exploring the juxtaposition of scholarly debates at different scopes and narratives of China and India through rigorous methodology, and the fifth stage of a co-production of knowledge that involves scrutiny of categories, mixed methods, non-uniform and incomplete evidence, and the commination of both inductive and deductive analysis.

2.5.4 Towards synthesis

In my theoretical exercise, I take the approach of the non-competitive paradigm of Harriss-White and respect the theoretical pluralism of the various existing debates. It is worth stressing that my purpose of looking for the crucial mechanism of LCD through comparative studies also has its roots in Mill's Two Methods of Comparison and Bhaskar's Critical Realism of philosophy of science, as I argued in the epistemology section of the Introduction chapter. In this way, a synthesized China-India comparative framework forms the third pillar of my theoretical framework.

2.6 Analytical framework

Thus far I have shown how both the harmony and conflict paradigms of theoretical clusters of institutional change, general and LCD/EE policy and multi-disciplinary China-India comparison have prepared rich yet insufficient theoretical materials for my project. I have also identified three synthesized theories from the theoretical mapping as pillars to support building my analytical framework. These three theories are Tang's general theory of institutional change, Schafferian theory of policy as practical zones, and Harriss-White's non-competitive China-India comparison.

In this section, I first clarify some key concepts in the proposed analytical framework. I then propose the analytical framework of five phases, and close the section with an acknowledgement of the limitations of the framework.

2.6.1 Concepts

To prepare the readers to fully understand my proposed framework, I revisit and further clarify a few sets of concepts for my research contexts that will be employed but might cause ambiguities.

2.6.1a Institutions and Organizations

Although “institutions and organizations are easily confused” (North and Weingast, 2006, p.21), it is crucial to differentiate the two in the first place. Because -

1. This differentiation forms the foundation of institutional change theory, which is one of the pillars of my framework;
2. There are multiple uses of “institutions” in EE governance literature that will potentially lead to ambiguity in the discussion, and
3. The explicitness of the comparative study between China and India requires this distinction.

North (1990, Chapter 1) used the “Game” metaphor to differentiate institutions and organizations: institutions are the rules of the game, while organizations are the teams that play the game. In other words, institutions outline the invisible but crucial rules that structure the behavior of all the players, and organizations are formed by a certain group of players in order to achieve their common goals. To be more specific, EE *institutions* refer to **those basic and fundamental mechanisms, paradigms and logics that structure the EE development in all levels**, and EE *organizations* refer to **the concrete entities that are made by the state or the market in realizing its goals in EE development**.

It should be especially noted that, the concept of “institutions” is variously defined in the field of EE governance literature as well as in different literatures. For example, the “Institutional Arrangements” chapter in IEA (2010) discusses the governance structure at different levels of various organizations and agencies, rather than the paradigms and logics that shape their organizational development. No new analysis can avoid acknowledging the many conceptualizations of the term “institution” in the existing literatures. The specific definition for EE institutions and organizations given above is for purposes of clarity and coherence of the argument here.

Given the comparative focus on contemporary China and India, the distinction between institutions and organizations is particularly important because it helps distinguish an explicit and comparable foundation for a multi-sector policy field (EE) in two complex societies (China and India). One of the most challenging methodological problems in the China-India comparison in EE and broader areas of LCD is identifying comparable variables. Due to the multi-dimensional differences in economic structure, natural resources, energy consumption behavior, climate and other geo-, socio-, economic, and political factors, it is difficult to make sense of a China-India comparison in EE purely relying on available quantitative data.

The thesis acknowledges and emphasizes that embedded institutions are crucial in EE and LCD in China and India. However, “institutions are extremely difficult to pin down observationally” (North, 2006, p.21), especially those informal rules that are not formally written in any form of texts. It is almost impossible to directly compare the invisible institutions that permeate all organizations, governance structures and specific policies in the absence of a prior preparation of formal procedural orders (Aoki, 2001). In contrast, organizations are much more observable and measurable. Through actors both inside and outside, they make decisions and take actions (North, 2006). Actors therefore shape institutions, and also offer effective means of investigating and comparing both institutions and organizations. So separating organization and institutions is not only a practical strategy to map out the comparative analysis of this chapter; but also it is a more explicit and evidence-based approach in taking forward the institutional analysis of China and India’s EE development.

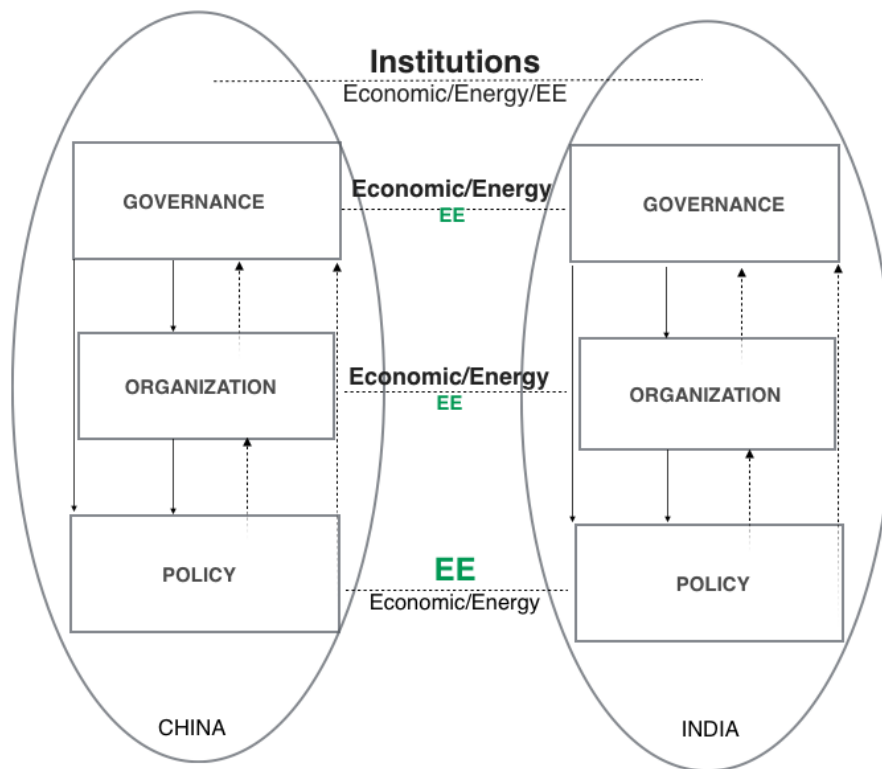
2.6.1b Governance and Policy

Compared to “institutions” that are themselves the “rule (s) of the game”, governance involves the governmental and market structures that are formed within the “rules” in order to “play the game”. Comparing with “organizations” that are the actual “teams to play the game”, governance represents the more abstract and overarching structures that shape the way organizations interact with each other. In that sense governance can be situated conceptually between institutions and organizations (Fig. 2.6).

According to Williamson (2000), Governance is “an effort to craft *order*, thereby to mitigate *conflict* and realize *mutual gains*”. Since this thesis is particularly interested in the state’s role in EE development, I thus define *governance* as the formal and informal mechanisms that are conferred by the state in structuring organizations.³⁴ In the meanwhile, EE *policy* refers to the kind of official legislation, principles and guidance that addresses the general or individual EE issues, which are generated from the interactions between institutions, governance and various organizations.

³⁴ I acknowledge that “governance” has broadened its scope to include non-state actors in the EE governance literature. But for the explicitness of the analysis, I will limit the definition of governance to practices within the state structure. Non-state actors are addressed through the interactions with the state actors in various ways where relevant in the thesis.

Figure 2.6 The Hierarchy of Institutions, Governance and Organizations



2.6.1c Critical junctures

Critical juncture is a concept that first developed in historical institutionalism theories that analyze how new institutions are created in a “critical juncture” when the actors failed to provide positive feedback to sustain the equilibrium in the old institutions (Greif and Laitin, 2004). “Junctures are ‘critical’ because they place institutional arrangements on paths or trajectories, which are then very difficult to alter.” (Pierson, 2004, p.135) Therefore, critical junctures “constitute the starting points for many path-dependent processes” (Capoccia and Kelemen, 2007) and form new institutions. In my project, I identify two critical junctures of China and India’s EE development. The empirical analysis will be organized in a chronological order of the two junctures.

In India, EE policies started after the first and second international oil shocks in the 1970s, yet it was not until 2001, when the Energy Conservation Act was passed by the parliament that the formal legalization of EE arrived in India. In China, EE policies started right after the Cultural Revolution in the last two years of the 1970s, and the Energy Conservation Law in 1997 signalled its formal legalization. Since this period forms the origins and initial development of EE institutions in contemporary China and India, I identify it as the first critical juncture (Chapter 3).

Around 2006-2008, the irresistible pressure from the International Climate Change Negotiations (ICCN) started to intensify in domestic policy processes, forcing the Chinese and Indian governments to link EE with the national and international climate change agenda. Around the same period of time, the international financial crisis broke out, which made a complicated and huge impact on the Chinese and Indian economy. The post-crisis economic policies influenced EE to a significant extent. The two forces - ICCN and post-financial crisis economic policies - together formed a second critical juncture for the development of EE institutions (Chapter 4 [China] & 5 [India]).

2.6.2 Analytical framework of five phases

To recapitulate the epistemological terms I consider crucial to my research topic: first, I consider LCD in China and India as a unique *institutional change* process; second, I aim for an mechanismic explanation of the LCD institutional change; third, I take consideration of the time, space and political economy as crucially important dimensions of this intellectual investigation; and fourth, the topic is explored and

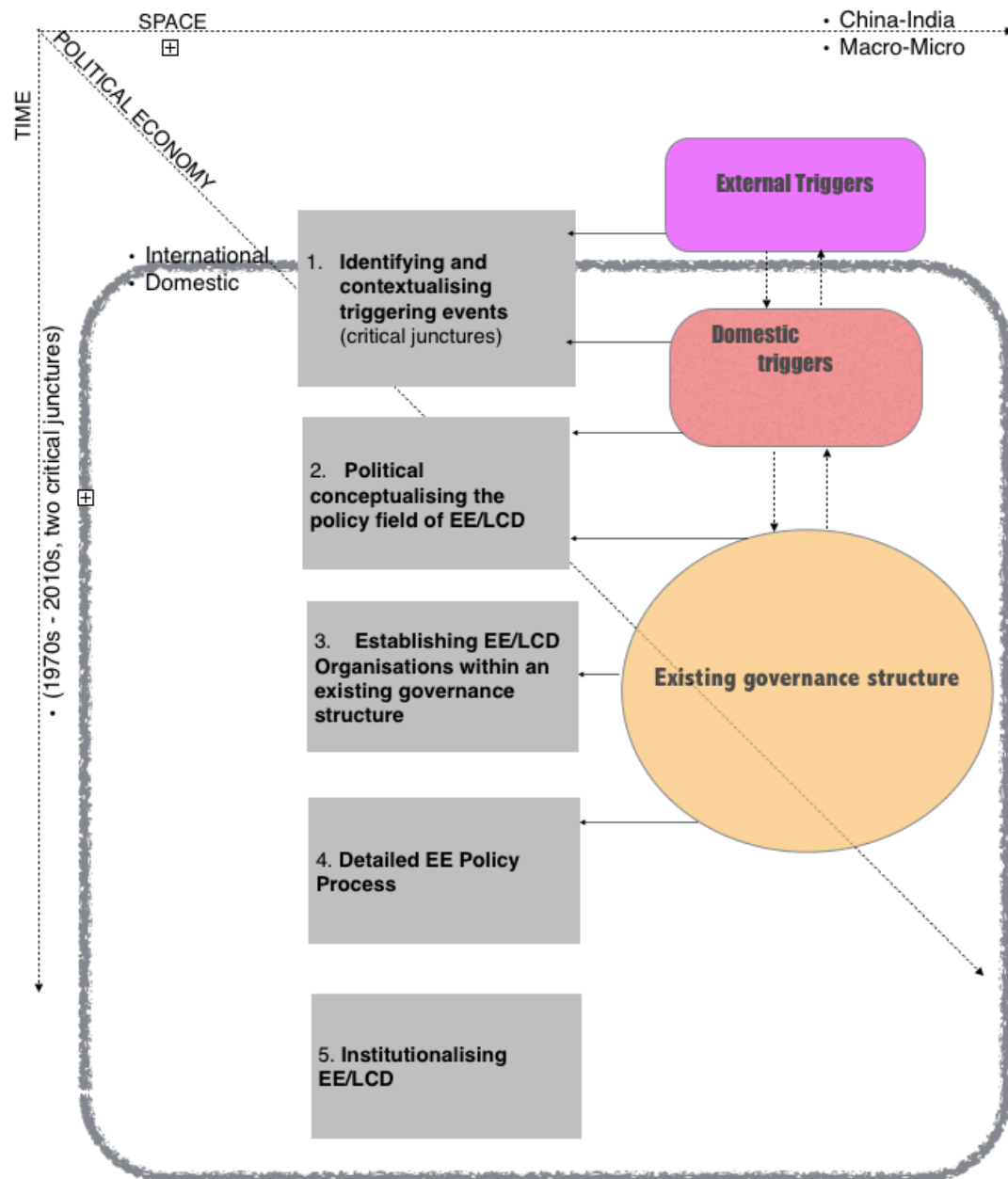
tested through a China-India comparative study. All of the aforementioned four points are considered in my analytical framework, so is in my selection of theoretical building blocks: the first cluster of general theory - institutional change - enables me to analyze the self-reinforcing/reflecting interactions between various critical players during the two critical junctures of EE institutionalization in China and India; the second cluster of theories – policy process - provides a structured framework to deconstruct the politics of policy in relation to the development of institutions; while the third – comparative methodology - offers rigorous framework for my China-India comparison.

Building on this theoretical mapping, a *mechanismic, systemic, and political-economic framework of LCD in contemporary China and India* I propose examines LCD institutional change process through a combined analytical framework of the concepts and theories presented above.

The five phases of my framework of a single round of institutional change process for LCD are:

1. Identifying and contextualizing the triggering events (critical junctures),
2. Political conceptualizing the policy field of LCD,
3. Establishing LCD organizations within an existing governance structure,
4. Detailed policy process,
5. Institutionalizing LCD – legalization/establishment of sub-fields.

Figure 2.7 Five-phase analytical framework under the three dimensions of time, space and political economy



I now present the theoretical sources, propositions and inter-relationships of the five phases of the framework, and how I will apply it to the analysis of the two critical junctures of LCD institutional change process in China and India respectively.

Phase 1. Identifying and contextualizing the triggering events

First, I ask the question: what are the external/internal events/crises that triggered the development of the critical juncture of EE in a given political economy? Following the identification of the critical juncture and the triggering events, how are those events contextualized within the political and economic contexts in relevance to EE/LCD at that particular time in China and in India?

As I show in the empirical chapters, the emergence of EC/EE as a major policy concept in China and India was driven by significant yet distinct external and domestic crises. This process responds to the first phase of Tang (2011)'s **generation of ideas**. In Tang (2010), for any institutional change, the first step is to generate ideas for the intended change. Contextualizing the triggering events for the development of EC/EE in the specific time, space and political economic conditions channels the generation and reinvention of EC/EE ideas in China and India through intense interaction between domestic and international events relevant EE/EC. This phase witnesses the original formation EC/EE/LCD ideas in a developing society, especially within the policy cohort.

Phase 2. Political conceptualizing the policy field of LCD

Second, I ask the question: how does the state conceptualize EE/LCD in order to mobilize political, ideological, economic and social resources for EE/EC policy and institutional development?

After contextualizing the triggering events for EE/LCD, EE becomes a real policy objective. In order to legitimize the institutional, organizational and policy actions towards EE/LCD, the state needs to conceptualize the policy field of EE/LCD in the specific institutional context. This phase resonates to the **zone of authorization** in the Schafferian framework. It involves the decisions on the themes, agendas, languages, scopes, etc. I pay special attention to examine how the conceptualization of LCD in

China and India created “hatches of hiving” (Chapter 3, 4 & 5) and problems of policy contradictions (Chapter 6 & 7).

This phase also responds to the step two in Tang’s institutional change theory of **political mobilization** for realizing the ideas generated from the previous step. In this stage, stakeholder groups that hold different opinions/preferences towards EE/LCD compete for the institutional arrangement that would benefit their group interest the most. These groups in my researched area include state leaders, bureaucrats of different ministries, state-owned enterprises, influential energy and environmental policy advocacies, think tanks and industrial associations. The material and political resources decides the result of the competition (Tilly, 1978). The final conceptualization of EE/LCD reflects the result of the negotiation and competition of such political mobilization process.

Phase 3. Establishing LCD organizations within an existing governance structure

Third, I ask the question: what is the relationship between the organizational development for EE and the existing economic and/or energy governance structure?

During and after phase 2, organizations to serve the purpose of realizing EE at different levels start to form. Yet, since EE/LCD is a newly contextualized and conceptualized idea in the policy field, it normally does not enjoy necessary priorities and resources to support independent and separate organizational arrangements. In both China and India, EE organizations were established within an existing governance structure - in China it was the case of the economic governance, and in India the energy governance. This bundling structure, as I will show in the empirical analysis, became the crucial mechanism for understanding LCD institutionalization processes in China and India.

This phase responds to the third phase of Tang (2011) - **The struggle for power to design and dictate specific institutional arrangement** and the zone of **resource allocation** in the Schafferian framework. Together with the phase of political conceptualization, they constitute the period of conflict. The formation of EE/LCD organizations is a result of competition, negotiation and struggle for the power of decision-making and execution for the rules/norms/policies during this process. It is also a process of allocate organizational resources to enable the conceptualized EE/LCD policy arenas. Yet comparing to Tang's phase 3 that is centered by the power competition to the rule making and Schaffer's zone of resource allocation, my phase 3 pays more attention to the complicated relationship between EE/LCD organizations and their hosting governance structure. The multi-nested power politics of this relationship generate immense and long-lasting path-dependent influences to the LCD institutionalization process of China and India.

Phase 4. Detailed policy process

Fourth, I ask the questions: what EE/LCD policies are made, and how does the policy process shape and be shaped by the emergent EE/LCD institutional settings?

EE/LCD are realized through a series of actual policies. Policy processes therefore constitute an active component of the institutional change process. Policies are both the result and causes of institutional change processes. This phase responds to the phase 4 of **setting of the rules** in Tang's theory of institutional change. After the power struggle for rule making, the winning group(s) will play the dominating role(s) in policy process. This process involves all of the zones of **political practices** in the Shafferian framework, with a focus of the zone of **establishment**. It also involves intense politics of conflicts, negotiations as well as coordination and collaborations.

On the one hand, within the individual policies, mechanisms are formed through the overlapping stages of authorization, establishment and allocation. On the other, those policy mechanisms fit into the bigger institutional change dynamics as active agents. The nuanced interactions of policy stakeholders are surrounded by specific EE/LCD themes in this case, yet the rules of this interplay suggest some of the crucial mechanisms of the LCD institutional change process in the general sense. I explore this multi-layered politics of policy process and its interplay with the institutionalization process with a case study of China's rural EE policy in the second critical juncture (Chapter 6 and 7).

Phase 5. Institutionalizing LCD – legalization/establishment of sub-fields

In the end, I ask the question: what kinds of EE institutions are formed in and from these critical junctures?

After all of the phases of contextualizing triggering events, conceptualizing EE/LCD, establishing EE/LCD organizations, actual policy processes, we come to the last phase of the institutional change process – consolidating and stabilizing the LCD institutions that stemmed from the previous stages. This phase responds to Tang's last phase of Legitimization, Stabilization and Reproduction, where institutions formed are tested in a political and economic context. If the institution in the end improved the overall welfare of the whole society, it is likely to be legitimized until the next alternative appears. Tang concludes a single round of institutionalization with this. This final stage of Tang's theory, together with the previous phase of rule making, reflects the reproduction and inheritance of genes in the Darwinian evolutionary theory.

In the case of LCD/EE of China and India, the last phase of my analytical framework signals the end of an institutional change round started from one critical juncture. By

using and repeating the framework, I investigate the two rounds of institutionalization processes in China and India through this framework from the 1970s to the present day.

2.6.3 Caveats

This thesis will not talk about the “embeddedness” of institutions which refers to the informal institutions constituted by social, religious and customary norms (Williamson, 2000), simply because the scope of the thesis and the data collected by the author prevent this. But I fully acknowledge the importance of those informal rules in structuring the institutional development of EE and LCD in China and India and I will touch upon some of the differences between the bureaucratic cultures in my analysis of the second critical juncture. But the narratives will keep a focus on the interaction between state organizations, governance structures, the formation of institutions and the distinctive political economy of China and India. The case study of China’s rural EE will also connect villagers’ everyday life with the EE institutionalization process and the politics of policy in the given political and economic context. Yet the emphasis of the argument will be made on the formal EE institutions and mechanisms that emerged.

2.6.4 Assessment

By answering the questions asked in the five phases of my analytical framework in the context of contemporary China and India, I map out the process of institutional change of EE in China and India. I investigate in-depth how political economic factors fuel the self-reinforcing process between institutions, governance, organizations and policies. Building on this, I discuss the crucial mechanisms of LCD

institutional change process in China and India. From there, I assess the confidence of this analytical framework in my project. In the end, I validate and justify the potential applications of a mechanistic, systematic and political-economic theory in future comparative studies of LCD in large and complex countries with fast economic growth.³⁵

³⁵ I acknowledge that leaders are important to LCD in both China and India, but the focus of the thesis will be on institution. The roles of leadership will be examined under the framework of institutional change.

CHAPTER 3. INDIA AND CHINA IN THE FIRST CRITICAL JUNCTURE

This chapter focuses on the origins and formations of EE institutions in China and India from the 1970s till the early 2000s. Applying the five-phase analytical framework constructed in Chapter 2, I examine India and China's EE institutionalization process in the first critical juncture respectively. It should be noted that, since this chapter carries out the analysis of both India and China together, to save space and maintain clarity, in the section of each country, I use three subheadings instead of five. This technical arrangement does not compromise the incorporation of the whole five phases from the analytical framework. Then, I move to lay out a comparative discussion and outline some initial conclusions of the institutional mechanism emerged from this chapter.

3.1 India

India's first critical juncture for EE development was triggered by the international oil price hikes as a result of its alarmingly vulnerable oil dependency. EE was subsequently conceptualized as industrial efficiency promotions that can help to conserve the rising oil consumption. EE organizations started to establish within the complex energy governance structure. And EE policies remained to be market-oriented without compulsory requirements from the state. All of these, in addition to the political and economic context of India during this period, devised the formation of its distinct EE institutions.

3.1.1 The Oil Crisis: Enhancing Energy Security

In India, the first efforts at EE came from the anxiety of the increasing oil dependency, while the rest of the energy and economic sectors' focus was on

identifying supply sources to meet growing demand (Vasudevan et al, 2011). As early as 1970, realizing the need to understand supply-demand balances in an oil constrained world, the Indian Government set up the Fuel Policy Committee (FPC), to prepare an outline of national fuel policy for the next 15 years. Then in 1973, the world's first oil shock broke out. When this crisis began, India had unrealistically hoped that, the Arab states would give positive response to their friendly “developing countries brother”. However, OPEC was unable to adopt a dual pricing system (Dadwal, 2000). Because of the price hike, India's oil import bill jumped approximately 226% in 1974 (\$1,350) compared to 1973 (\$414 million) – around 40 per cent of its potential export earnings, and twice the amount of its existing foreign exchange reserves (MSPI, 2011). Such significant burdens made it urgent for a poor country like India to consider the implications of those changes for the economy. FPC's final report was submitted to the government in 1974, and a thorough analysis of both the technical and organizational aspects of energy planning was carried out. EE/EC on the supply side was placed in the centre of the report as a key solution to energy security (FPC, 1974).

The FPC report shows how the oil crisis in 1973 sensitized the Indian energy policy cohort to the high uncertainties of the international oil market, as well as the disastrous consequences of the crisis for energy consuming countries. The crisis especially alarmed the Indian government about the contradiction between its energy “self-sufficiency” ideology and its dependence on imports (Madan, 2006). Oil security became a high priority of the government (Ahn and Graczyk, 2012). As a consequence, in 1976, the government formed the Petroleum Conservation Action Group, which was reconstituted as the Petroleum Conservation Research Association

in 1978. Its objective was conservation of petroleum products by promoting fuel efficiency as well as the substitution of petroleum products by alternative sources of energy. Those research-oriented organizations established the foundation of EE/EC in official organizational forms in contemporary India.

3.1.2 EE organizational development under the energy governance

The domestic contextualization of the oil crises and the political conceptualization of EE within the Indian policy cohort preluded the organizational arrangement of EE in India during this period.

The organizational development of EC, though in its primitive stage, signaled the close relationship with EC/EE governance and India's energy sector. The EE agenda was initiated and mainly developed by the petroleum sector, and was driven by oil security, thanks to the increase in imported crude oil, and the dominating importance of oil in the economy during that period of time. Instead of EE for the whole economy, the primary goal of EC was saving oil consumption. For example, the FPC report even recommended the substitution of petroleum by coal, because coal could be sufficiently produced domestically at that time. This approach of EE development was not unique. It was dominant throughout the pathways of oil importing countries, including the developed world in the 1970s. It also led to the creation of IEA, the main international organization mandated with enhancing energy security as well as promoting energy efficiency today (Scott, 1994).

Since late 1970s, the state of energy shortage, especially in the electricity sector, had become increasingly salient with the growing deficit of the State Electricity Boards

and the stagnation in electricity reform (Dubash and Rao, 2001, Dubash, 2003, Dubash and Rajan, 2007, Chikkatur and Sagar, 2008). The situation was worsened by the rising demand for energy as a result of economic growth. In the same period, EC organizations gradually developed from the oil sector to the overall energy governance. The Working Group on Energy Policy (WGEP) was formed by the government in 1977 in order to carry out a comprehensive review of the energy situation for the next 5-15 years, and to “recommend appropriate policy measures for optimal utilization of available energy resources including non-conventional sources of energy”. Fuel efficiency for electrical and diesel pumps, lighting and cooking appliances were also highlighted in the recommendations (WGEP, 1979). This report showed that after the pure focus on oil supply efficiency, EE in other forms of energy, as well as the demand side management was of interest to the policy cohort. It also reflected the holistic pressure of the energy shortage at that time.

In August 1981, the Government of India further constituted the Inter-Ministerial Working Group (IMWG) on Energy Conservation, which was the first dedicated high-rank official entity commissioned in particular for comprehensive EC/EE policy. The IMWG produced the first concrete proposal for energy consumption reduction in India (Balachandra, 2010). The key outcome of the report was the proposal of an apex body to initiate, coordinate, integrate and monitor the progress and implementation of various energy conservation measures in India. Clearly, the IMWG considered that a dedicated nodal organization was crucial in realizing EC/EE in India. However, this proposal did not get much attention from the decision-makers that reflected the low priority of EC in the political agenda (ABE, 1986).

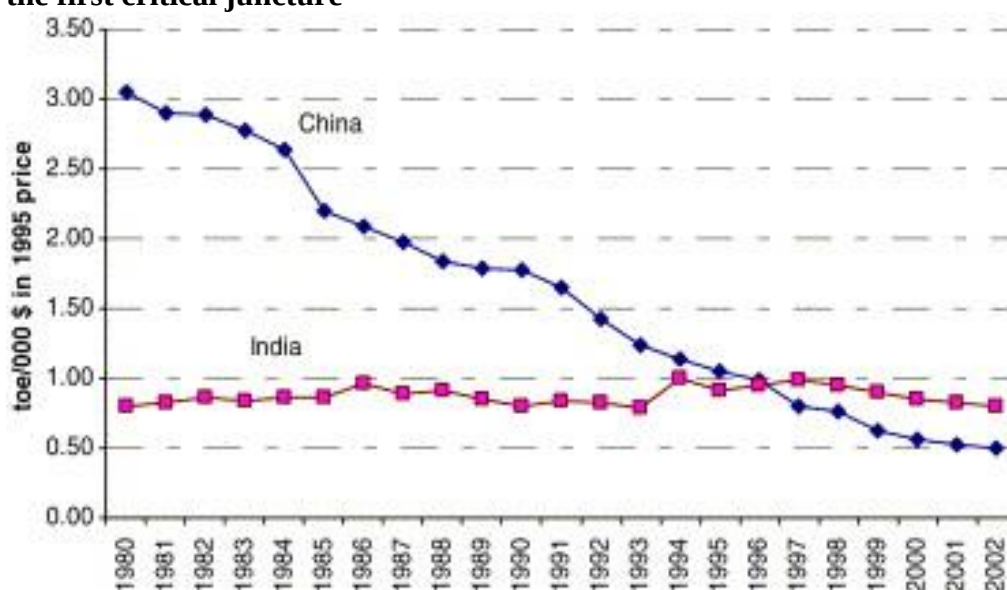
On the other hand, the integration of energy planning into the national planning progressed much faster than EE. In 1983, the Advisory Board on Energy (ABE) was set up by the Prime Minister's Office for the formulation of the energy planning in the Seventh Five-Year Plan (FYP) (1985-1989). Among ABE's series of publications on crucial energy issues of India, its 1986 publication *Energy Conservation: Challenges and Opportunities* addressed EC - the most important "hidden fuel" in the energy scenario. The report clearly stated that "(f)ar too little awareness exists of the need for conservation and a great deal of work is necessary to detail and implement strategies to effect conservation of energy". In addition to reiterating the recommendations made by the previous IMWG report, the ABE 1986 report analysed in detail "Ten success stories in Energy Conservation", which were based on the studies that were specially commissioned by the ABE. The ten stories covered nearly all of the energy intensive industries identified in the IMWG report: iron and steel, textile, petroleum and refinery, pulp and paper, aluminium, chemicals and fertilizer. The starting point of the energy efficiency project of the ten exemplars was around 1979-1981. And their motives were to increase the EE of production – reduced consumption of fuel/coal and other forms of primary energy per unit of production (ABE, 1986).

This profit-driven search for EE was representative of an important part of the industrial reforms of the Indian economy started in the 1980s and lasted into the early 2000s (Panagariya, 2005).³⁶ But the primary objective of the enterprises was not to improve energy efficiency. Rather, their major concerns were modernization of the production process, expansion of production capacity and a secure supply of power for enterprises (Alagh, 2009). Consequently, the enterprises might have achieved their

³⁶ Also see Vasudevan (2011) on the various industrial associations' "bottom-up" EE initiatives since the late 1970s.

primary goals, but failed to significantly increase EE (Vasudevan, 2011, Yang, 2006). The situation remained unchanged in the 1990s onwards, when significant foreign donors' investment poured into India's EE development (Yang, 2006). Throughout the 1980s to early 2000s, the energy intensity in India's industrial sector, though seeing mild fluctuations, basically persisted at the same level (Fig. 3.1).

Figure 3.1 Energy intensities in the industrial sectors in India and China during the first critical juncture



Source: Yang (2006), based on IEA data.

Contrary to the self-motivated and profit-driven EE development from the industries, EE remained a low priority on the political agenda, despite the continuous EC/EE discussions in the policy cohort. It was not until late 1980s that more concrete EE organizational progress was finally seen in the formal public sector. In 1987, ABE commissioned the Indian Law Institute to prepare a draft of the Energy Conservation Bill for enactment by the Parliament. The draft was largely dependent on the proposal made by the IMWG report 1983, and completed in 1988. The main purpose of the bill was again to constitute a nodal government agency for EC. While it would take yet

another decade for the government to transform the draft bill into a real Act, the Nodal Energy Conservation Organization (NECO) was established following the draft (Dey, 2007). A year later, the Energy Management Centre (EMC) replaced NECO (Balachandra, 2010). EMC, the first-ever long-term EE organization in India was registered under the Department of Power (DoP). In essence, it was an autonomous organization registered under DoP, without dedicated bureaucratic support - still far away from the status of an official bureau. Its coordination responsibilities were wide and comprehensive, which included: energy auditing of consumers both in the industrial and commercial sectors; energy management systems and energy conservation; rural and urban energy systems; education and training; as well as energy generation and conservation based employment and poverty alleviation programs. However, due to the lack of legal legitimacy, inadequate manpower and its low status within a powerful ministerial department, it was almost impossible for the EMC to fulfil its ambitious goals.³⁷

The constitution of EMC signalled the formal establishment of EE governance within the governance of energy, and in particular the central power governance. This governance structure was strengthened by the legal foundation of the Energy Conservation Act 2001. The Act transferred EMC into the Bureau of Energy Efficiency (BEE) under the administration of the Ministry of Power (MoP). From the mid-1980s onwards, the erstwhile DoP (restructured as MoP in 1992) started to function as the central government ministry to facilitate the implementation of a coordinated strategy on EC (Vasudevan, 2011) (Fig. 3.2). In the first place, this organizational arrangement was for reasons of the practical politics of interest.

³⁷ Interview with Mr. Girish Sethi, Director of Industrial Energy Efficiency Division, TERI, April 2014, New Delhi.

According to a former senior official in the MoP,³⁸ since the petroleum sector had initiated the EE discussion, it was suggested that the EMC could go to the Ministry of Petroleum. But internal opponents did not allow this to happen. Other energy related ministries repelled EMC. Then DoP became the least resistant host ministerial agency among all the relevant candidates. However, the DoP's primary goal was increasing energy supply in order to meet the escalating demand caused by the growing economy. This original priority, collectively with the national slogan of "poverty reduction" had set aside EC/EE from the policy agenda by a series of manipulated institutionalizing process. This point will be elaborated in detail in the following section.

This conflict between the hosting organization and the newly created EE organization had endured through a quarter century of its history. During the parliamentary discussion of the Energy Conservation Act in the late 1990s, EMC indeed had another chance: it could either become an autonomous government agency, or shift its affiliation to the ministry that best suits its will.³⁹ The result was the status quo. Responding to the question of the rationale behind this choice during a fieldwork interview in April 2014, Dr. Ajay Mathur, Director of BEE said, "MoP has kindly taken us...we are comfortable here. We enjoy the protection of MoP... there is no better choice." Paradoxically, BEE's "compatibility" with MoP is constantly challenged by the administrative conflict, besides the embedded contradiction of their policy priority. Since BEE shares one Secretary with MoP, it is represented by MoP in Parliament. BEE's budget has to be proved by MoP before it goes to the Parliament;

³⁸ Interview with an anonymous Senior Fellow of TERI, March 2014, New Delhi,

³⁹ Potential hosting ministries at least included the Ministry of New and Renewable Energy (MNRE) and the Ministry of Environment and the Forest (MoEF). EE policy priority conflicts less with either of the both than with the MoP. Source: see footnote 8.

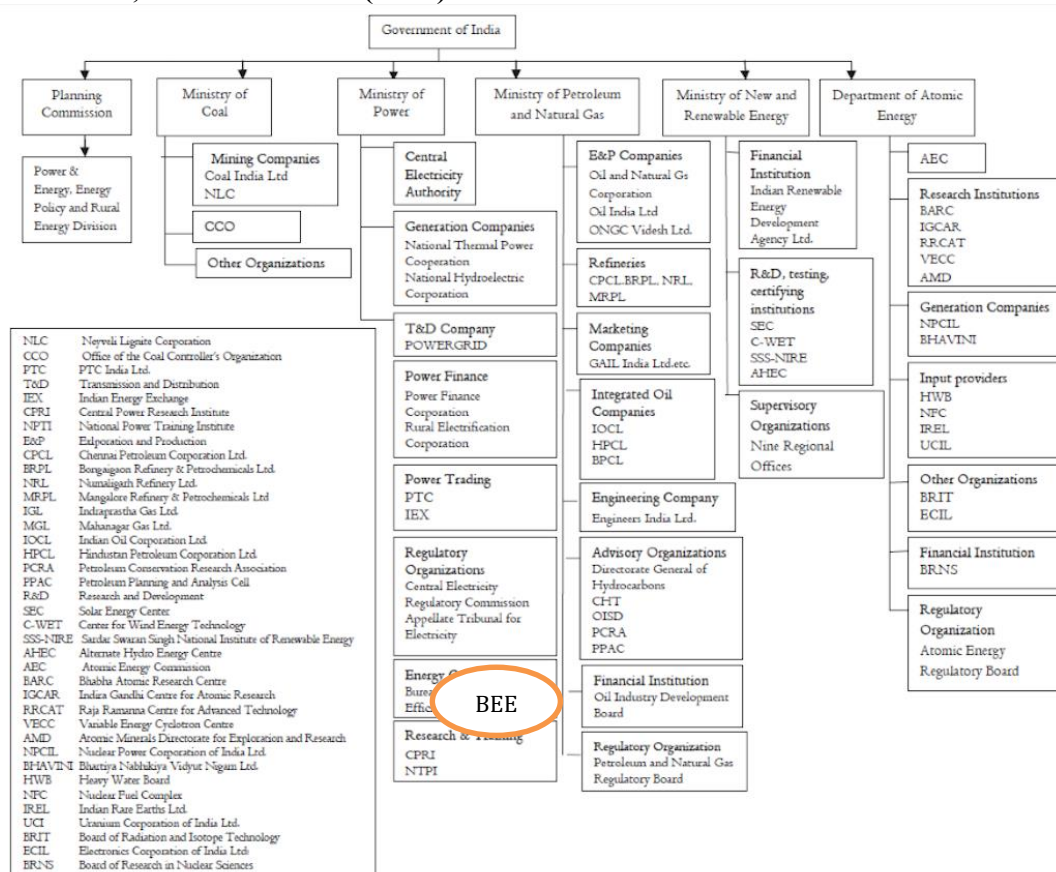
the same applies to other aspects such as the management of manpower and any significant policy initiatives. The “protection” from MoP is unavoidably accompanied by various forms of constraints. Keeping the status quo seemed to be a “rational choice” not based on scientific rationality but on a survival rationality nested in political conflict and constraint.

In addition, EE policy is characterized as multi-sectored and multi-layered. So policy making and implementation require extensive collaboration – from consensus building, information sharing, resource mobilizing, implementation to monitoring and evaluation - with various sectors of the economy such as energy, heavy/light industry, urban development, agriculture, rural development. All of them enjoy much higher administrative rank as well as much more affluent resources than EMC/BEE. Being a frailly constituted autonomous agency affiliated under the powerful DoP, and indeed without strong backing from the host ministry, India’s nodal EE organization was effectively disabled in negotiating and coordinating EE policies with related ministerial central government agencies. The situation is even worse at the sub-national level, where EMC/BEE has nominal rather than actual dedicated organizational arrangements for coordination, implementation and other management activity.⁴⁰

⁴⁰ Item 15 (d) in Chapter VI of The Energy Conservation Act 2001 said: “(the State Government may, by notification, in consultation with the Bureau) designate any agency as designated agency to coordinate, regulate and enforce provisions of this Act within the State.” However according to interviews with national and subnational officials, in practice, such designated subnational agencies are normally subject to one or two personnel under the subnational branches of Ministry of Urban Development, Ministry of Environment and Forestry and Central Electricity Commission. EE is only the minor task burdened by designated personnel apart from his/her major job in the certain government agency. In addition, India’s central energy governance overall has limited influence on the sub-national governments. See Madan (2006), Ahn and Graczyk (2012).

Given this evidence, it is possible to presume that what Dr. Mathur claimed “there is no better choice” indicated the lack of a truly practical alternative for EE other than the current situation.

Fig. 3.2 EE organization (BEE) in the organizational pyramid of India’s energy governance, based on TERI (2009).



3.1.3 EE Institutionalization between “Energy Security” and “Poverty Alleviation”: a Constrained Equilibrium

In the 1970s, India, as a net oil importer and a poor economy, the first and second oil crises drove the formation of the initial critical juncture for its EE development. It was “Energy Security”, or more precisely “Oil Security” that brought EC/EE concerns into the policy context. Consequently, EC organizations were gradually developed, though with back and forth under the shelter and shadow of energy governance: from the oil sector (late 1970s) to the power sector (1980s – the present). The organizational and

institutional environment of energy governance further embedded its own ideology of “energy security” into EE governance.

Since then, EE governance in India has been imprinted by the contrasting institutional repercussions of “energy security” applicable in India as well as globally. On the one hand, EE is considered by IEA and acknowledged by the Indian Government as the most important “hidden fuel” (IEA, 2013, BEE, 2008); thus EE is crucial in enhancing energy security, and EC/EE is rationalized as an integral part of the energy governance in the first place. On the other, the chief, if not the only priority of energy governance is increasing energy supply, rather than promoting efficiency.

In addition, what made India’s EE institution unique from the OECD countries, is the other parallel ideology of “poverty alleviation”. “Poverty alleviation” was emphasised in almost all of India’s development policies throughout the 1970s well into the 2000s (Lipton 1993, Gupta 1997, Ferro et al, 2004). It also provided unquestionable legitimacy for increasing energy supply to fight energy poverty.⁴¹ However, the ineffective energy and electricity reforms throughout the 1980s into the 2000s had continuously prevented adequate energy supply, especially to the mass (rural) poor (Dubash, 2003, Tranum, 2013, Kumar and Chatterjee, 2012). India’s rural electrification as well as per capita electricity consumption still remain at the lowest amongst the major developing countries.⁴² India’s industrial sector that has been substantially freed by the relatively more successful economic reforms (1980s) and

⁴¹ India’s energy poverty is among the worst in the world. According to data from National Sample Survey Organization (NSSO), GoI, only 56% households in India has access to electricity while 89% rural households depend on polluting energy sources in 2008 (Jain, 2010). Another survey shows that 57 percent of India’s rural households and 28 percent of urban households do not have sufficient energy access (from either clean or polluting sources) compared to essential demands (World Bank, 2010).

⁴² Source: Economist Intelligent Unit.

liberalization (1990s), chose to act on their own in promoting EE at the individual level of the company. Such self-motivated initiatives re-enforced the carefully managed scope of EE governance in a highly constrained governance environment: it is in the industry's own interest to promote EE; therefore with limited governance efforts,⁴³ EE could flourish by market forces. Hand in hand, the “poverty alleviation” ideology provided the route of legitimizing the already highly constrained resource allocation from the government to EE development: “subsidising EE would result in compensating the industries by using precious public funds that should be dedicated to reducing poverty”.⁴⁴

Ironically, reducing poverty through EC was itself an integral part of EC legitimacy as conceptualized by the government in the first place – cultivating the “hidden fuel” to feed the energy demand of the mass poor. In other words, “poverty alleviation” on the one hand legitimized EC/EE, and on the other, provided legitimate escape-hatches for the government to prevent a full-fledged development of EC/EE governance. In the particular political economic environment of India, the existing institutions of “poverty alleviation”, alongside “energy security” re-enforced the weak status of EE governance that emerged from its interaction with the powerful energy governance.

Nevertheless, due to the profit-driven compulsions, despite achieving profit objectives, the Indian industry's efforts at EE did not lead to substantial EE promotion on the overall industrial energy intensity (Fig. 3.1). In other words, “market forces” do not work in EE as effectively as they were expected by the government. Rather, the

⁴³ Such nominal efforts include several award and voluntary EE schemes; for example, the voluntary Eco-Mark designed for home appliances that were launched during the 1990s to early 2000s. There were rarely any taker of such schemes (Balachandra, 2010).

⁴⁴ Anonymous fieldwork interviews with government official in April 2014, New Delhi.

experience contradicted the manipulated legitimacy of weak EE governance. Despite the “market fiction”, India’s parliamentary politics had successfully translated those loosely grounded ideologies and logics - “poverty alleviation” and “market forces” – into the institution of “no government subsidy for EE” in the Energy Conservation Act 2001: the proposed schemes of government subsidies for EE were completely removed from the bill. By doing so, the political system played a crucial role in reinforcing and sustaining the “low level” institutional equilibrium of EE.

As a result of these multi-layered self-reinforcing processes, India gradually developed the paradigm relying on the market to realize EE, while the government limits its role to being a “market regulator and administrator” (BEE, 2008). With the pull of unstoppable rise of energy demand stemming from the accelerating economic growth since the 1980s, and with the push of the foreign donors’ persisting lobbying and investment in EE since the 1990s,⁴⁵ EE became more and more salient in the policy discourse in late 1990s and early 2000s. This was signalled by the Energy Conservation Act passing through the Parliament in 2001 after nearly 20 years of incubation. Contradictorily, the re-enforceability between 1. the weak EE organizations under the aggressive but ineffective energy governance, 2. priority given to increasing the supply of “energy security” institutions and organisations, and 3. the self-strengthening/defeating manipulation of the “market mechanism” and the “poverty alleviation” ideology, created and sustained the weak status of EE governance in India. And the principal policy precondition of EE development that structures future EE policies – “no government subsidy” was formalized. The

⁴⁵ See various India-EE projects such as World Bank (2015), UNDP (2011), USAID (2015), Asian Development Bank (2005), Agence Française de Développement (2013), Swiss Agency (2012), Japan International Cooperation Agency (2014), and German Development Bank (2003). It deserves another essay to discuss about the foreign donor’s motivation and strategy in promoting EE in India.

distinctive political economy of India sustained this constrained institutional equilibrium to the present.

3.2 China

China's first critical juncture of EE development was triggered by a different crisis from India – the domestic economic disorder. The political conceptualization of EE then was closely bundled with the economic consolidation agenda, which also led to a bundling structure between the newly established EE organizations with the existing economic planning system. This bundling structure made possible the radical EC/EE policies in China. In the end, a completely different EE institution from India's was formed in China during this period.

3.2.1 The Political Turmoil: Restoring the Economic Order

When the first oil crisis broke out in 1973-74, *People's Daily*, the flagship government propaganda platform, covered the crisis as much as the *New York Times* (Woodard, 1980, p.13-15). However, compared to India, the Chinese government's reaction focused on criticizing the greedy profit structure of the Western energy system, and they regarded the crisis as a political device of monopoly capital to strengthen its dominance in the market (Woodard, 1980, p.13-15). Unlike India, which related the oil crisis directly to its own energy security, and was much alarmed by its consequences, China seemed to be uninterested in this crucial event that changed the whole geopolitics of the global energy landscape.

One reason of this radically different response, compared with India's then increasing dependence on imported oil, till 1973-74, China was exporting 10% of its total

petroleum production (Lieberthal and Oksenberg 1988, p202). Also, China had maintained 97% self-sufficiency in total energy supplies for more than 20 years, which was largely thanks to the strict implementation of *Zi Ji Zi Zu* (自给自足) – the Self-Reliance slogan by the government (Kraus 2012, p138; Xu 2002, p86-94). On the other hand, in 1973, the country was in a completely different kind of crisis to India - in the middle of the political chaos of the Cultural Revolution (1966-1976). Propaganda was still deeply politically manipulated. The international oil shock was regarded by the government rather as a reflection of its philosophy of *Douzheng* (斗争) - fighting capitalism, instead of a thorough understanding of the world energy scenario and its implications for China.

Distorted by the political turmoil, rational and operational long-run planning during the Cultural Revolution was minimal (Naughton, 1990, p.743-767), which led to the continuous economic disorder that started as early as the Great Leap Forward (1958-1960). As part of the disorder, shortages of fuel and power were sources of increasingly obvious problems (Fingar, 1987, p.208). During the tumultuous ten years, the annual shortage of electric power was as high as 5×10^6 kW, and 24 out of 39 national electric networks - more than 1×10^5 kW capacity - could not even work normally (Chen and Chen, 2007). After Mao died in September 1976, his successors had to fight yet another brutal coup d'état in order to stabilize power (Spence, 1999, p.68; Vogel, 2011, p.22). With the victory in arresting the Gang of Four, the “Decade of Chaos”⁴⁶ officially ended in October 1976.

⁴⁶ China officially refers the Cultural Revolution as *Shinian Dongluan* (十年动乱) – decade of chaos after Deng Xiaoping came into power in late 1970s.

After stabilizing the political order, the new government had to restore economic order immediately, and control the energy and fuel shortage using urgent means. In 1977, the Central Committee of Communist Party of China (CPC), China's highest leadership entity, issued two official Documents commanding all levels of governments as follows: "from this year on, the supply of coal, petroleum and electricity will adopt the same quota system of *Kouliang* (口粮 food)",⁴⁷ and "electricity departments will supply electricity strictly according to the newly calculated consumption quota and production target".⁴⁸ The same method used in tackling the devastating famine (1958-1962)⁴⁹ was adopted and applied in response to the severe energy shortages, as an important step to establish economic order after the political turmoil. This tactic reflected the path dependence of China's economic policy-making; in addition, it motioned the symbolic starting point of China's contemporary EC/EE governance.

3.2.2 EE Organizations Internalized within the Economic Governance

The paramount triggering crisis and the consequent political conceptualization of the policy field of EE put China into a distinct EE organizational development pathway compared to India.

Facing the tough task of tackling the weak economy as soon as possible, the Chinese government realized from the very beginning, that EC was the most immediate and effective way to control energy consumption, so that at least the energy scarcity

⁴⁷ See: Central Committee of CPC Document (Zhonggong Zhongyang Wenjian) [1977] No. 12.

⁴⁸ See: Central Committee of CPC Document (Zhonggong Zhongyang Wenjian) [1977] No. 26.

⁴⁹ The famine is officially called "Three Years of Natural Disaster" that caused more than 30 million of unnatural deaths in China. See (Yang, 2012).

would not harm the process of economic stabilization. Apart from this practical understanding of EC, there was actually no other choice for China. During the Cultural Revolution, Mao dissolved the majority of the government ministries and sent the officials to labour camps or to rural areas for “re-education” (Harding, 2011, Zheng, 1997). The then- Ministry of Water Resources and Electric Power (MWREP), though remained, could not function at all (Xu, 2002, p.86-94). In the late 1970s, China did not have much possibility to increase power supply sufficiently through domestic production, because none of the capital, technology, planning, management, and governance capacity was effectively prepared (Xu, 2002, p.86-94). The dissimilar kind of the triggering crisis and the distinctive political economy of China compared with India during the 1970s had made it destined to take a different approach to EC/EE development.

The Notice, in the typical tone of “communist revolutionary” China, stated that the principles of fuel/electricity conservation must be strictly implemented through the quota system. If any Work Unit (*Dan Wei*⁵⁰) - either industrial or residential - consuming energy exceeds its quota for the year, penalties will be imposed on its next year’s quota allocation. Following the first set of fuel quota management orders from the highest political entity, the second Official Notice on EC directly came from the highest government economic planning and coordinating body – the State Council, and more specifically, the State Planning Commission (SPC) and the Economic Commission (EconC), the two most influential planning commissions overseeing all economic activities under the State Council. This arrangement set the tune for EE

⁵⁰ “Work Unit” is the English translation of *Dan Wei* – name of the basic economic organizations typically in contemporary China. It refers to all the public owned political and administrative organizations, social groups, as well as schools, universities, hospitals, media groups, etc. See Zhu (2008, p246-257).

governance development. Till the present, the Department of EC under the National Reform and Development Commission (NDRC), the equivalent of SPC and EconC combined remains the nodal government organization for EE development. At the subnational level, EC/EE is the subject of local Economic Commissions at different levels; and at the micro level, every *Dan Wei* has an office or designated personnel for EC/EE management. Situated throughout its history within the single most important vertical economic planning and management system, the internalization of China's EE governance in the economic governance structure started from the very beginning.

1978 was also the starting point of China's post-Mao economic reform, led by the pragmatic leader Deng Xiaoping. EE policy during this period of time was characterized as "implementing-at-any-cost" the quota system. For example, if any energy consumption unit was expected to exceed its quota, its electricity supply would be cut off without any mercy. This regulatory tool is called *La Zha Xian Dian* (拉闸限电) – controlling electricity consumption by switching off the supply. Thanks to the rigid supply control system of the Mao era, *La Zha Xian Dian* has been firmly implemented in the majority of the society. The regulatory mode of *La Zha Xian Dian* persists in ensuring EC/EE targets even into the 21st Century. The impact on EC/EE of the regulations of late 1970s, though short-term in their original purpose and characteristics, has been felt over three decades through path-dependence and the political process of self-reinforcement.

From 1980 to 1982, the State Council issued another three instructions on energy conservation to all levels of government: Energy Conservation Instruction No.2: State Council Instruction on Conserving Electricity Consumption (15th April 1981); Energy

Conservation Instruction No.3: State Council Instruction on Conserving Petroleum (17th April 1981), and Energy Conservation Instruction No. 4: State Council on Coal Consumption for Industrial Boilers (24th July, 1982). All the three instructions kept the consistency of the quota mode of EC regulation, involving target setting and strict penalties imposed on excess by the organizations responsible. The strict implementation of such a tough policy requires a target-driven government organizational structure with effective enforcement powers. However, rebuilding the government organizations and re-establishing the authority of the government was still the first task confronted by the economic reform regime (Xu, 2002, p86-94).

During the early 80s, the central government attempted to centralize energy and EC policy-making and implementation. On 25 August 1980, the State Energy Commission (SEC) was created under the SPC. One of the core responsibilities of the SEC was to policy making and coordination of EC (Qi, 2013, p7-9). Unfortunately, the SEC was abolished less than two years later in 1982. Created as a supra-ministerial agency, its importance and effectiveness had been diluted by the fact that it was partly created as a political vehicle for a power struggle, without a clear mandate and few resources (Xu, 2002, p86-94).

But the failure of the SEC further strengthened the connection between EC/EE and economic governance. Without effective energy governance to increase energy supplies, the government had to rely on the system of economic governance to implement strict EC targets. After the short-lived SEC, EC policy making remained in the hands of the SPC. The Office of Energy Conservation Work that set up in SPC was the de facto nodal organization overseeing nationwide EC/EE (Yang, 2006).

China then gradually developed the practice that EC/EE policy-making was internalized in, and implementation was based on, the wider structure of economic governance.

In the early reform era, the Chinese economy was already characterized as what Xu (2011) called “Regionally Decentralized Authoritarianism (RDA)” – a combination of decentralized economic governance and centralized political governance. Subnational governments already enjoyed great economic autonomy. With the deepening of economic liberalization, further autonomous power was granted to the subnational governments (Shirk, 1993). This structure was transplanted into EE governance. EC responsibilities ranged from setting the local EC target based on national guidelines, timely supervision and monitoring of the target realization progress, as well as implementing the stringent regulations of *La Zha Xian Dian*. All were to be devolved as subjects of the local branches of EconC.⁵¹ Accordingly, various energy management offices, departments and agencies at different levels of the provincial governments were established (Yang 2006). Such a political economy made the target-implementation-penalty mode of curbing energy consumption possible and effective – China’s industrial energy intensity reduced by almost 50% in the 1980s (Fig. 3.4).

Qi (2013) argued that the EC governance before 1992 was in compliance of the then national administrative system that is summarized by the CPC in 2011:⁵² SPC in collaboration with EconC set annual and FYP targets for EC in all categories of

⁵¹ See various governments EE guidance during 80s and 90s.

⁵² See *The Glorious Experience of Our Country's Administrative Management Institution Reform* (*Gaige Kaifang Yilai Woguo Xingzheng Guanli Tizhi Gaige de Guanghui Licheng*), in *People's Daily*. July 5th 2011: Beijing.

economic activities, including industry, transport, agriculture – as well as all the *Dan Weis*. Responsibility for supervision of policy implementation was distributed among different ministries, especially the energy and heavy industry related ones,⁵³ and implementing responsibilities were further distributed to different energy consumption entities. In other words, the EC targets were mainly realized through a centralized system through different ministries, instead of various subnational governments' economic governance organizations. This argument, based on the official account of China's administrative system during the 1980s, is, however, undermined by the following facts:

1. Due to the political turmoil under Mao and the subsequent power struggle among the top leaders, most ministries, in particular the energy-related ones were de facto dysfunctional in management terms and unable to implement the strict EC targets effectively;⁵⁴
2. With the privatization reform, China's state sector shrunk from 78% in the national economy in 1978 to 53% in 1991, and most of the SOEs were increasingly subject to subnational governments (Xu 2011), which left a more limited administrative territory for the centralized EC/EE management mode. Indeed some of the *Dan Wei*, especially in the heavy industry and energy related areas were still fully owned and controlled by the central ministries during that period of time. But these are supplementary rather than

⁵³ During the 1980s and beforehand, each individual energy industry was itself a ministry within government. Each reported to SPC and the State Council. See Lieberthal and Oksenberg (1988, p.63-134)

⁵⁴ At least three rounds of energy-related ministerial reshuffling (1979, 1982, 1988) and more frequent leadership change took place in this period of time. The state owned energy sector, especially the coal and petroleum industries was in huge amount of debt during this period of time (Xu, 2002, p86-94; Lieberthal and Oksenberg, 1988, p.95-p97). In addition, China's energy governance is characterized as "fragmented authority". See Lieberthal and Oksenberg (1988, p.22-23), Downs (2006) and Andrews-Speed (2009).

fundamental comments compared with the achievement of a decentralized economic governance structure described as RDA.

Compared with the fast-progressing economic reform in general, power reform in particular was kept on a trajectory of inefficiency. In the 1980s, the average growth rate in electricity production only halved that of GNP (Xu, 2002, p86-94). The serious power shortage posed a vital threat to the renewal of economic growth which reached an annual rate of 9.7% (1978-1985) compared to 4.9% between 1965 and 1978 (Perkins and Rawski 2008). Facing the persistent failure of energy governance, the Chinese government realized that it had to rely on a significant achievement in EC to compensate for supply shortages over a much longer term than had been initially expected. Aiming for long-term planning, from mid-1980s to 1990, another Inter-Ministerial Coordinating Working Group (IMCWG) was set up to oversee EC at the central level. A year after its formation in 1986, the State Council issued Energy Conservation Management Guidance (EC Guidance 1986) as quasi EC law to replace the previous Official Notices on EC.⁵⁵ The Guidance laid out a comprehensive regulatory scheme, ranging from an EC management system, energy supply management, energy consumption management for both industry and households, EC R&D promotion and an award/penalty system, to public awareness and education on EC.

This backbone EC regulatory document came into existence in 1997 before the Energy Conservation Law, signalling a shift in China's EC/EE governance from a

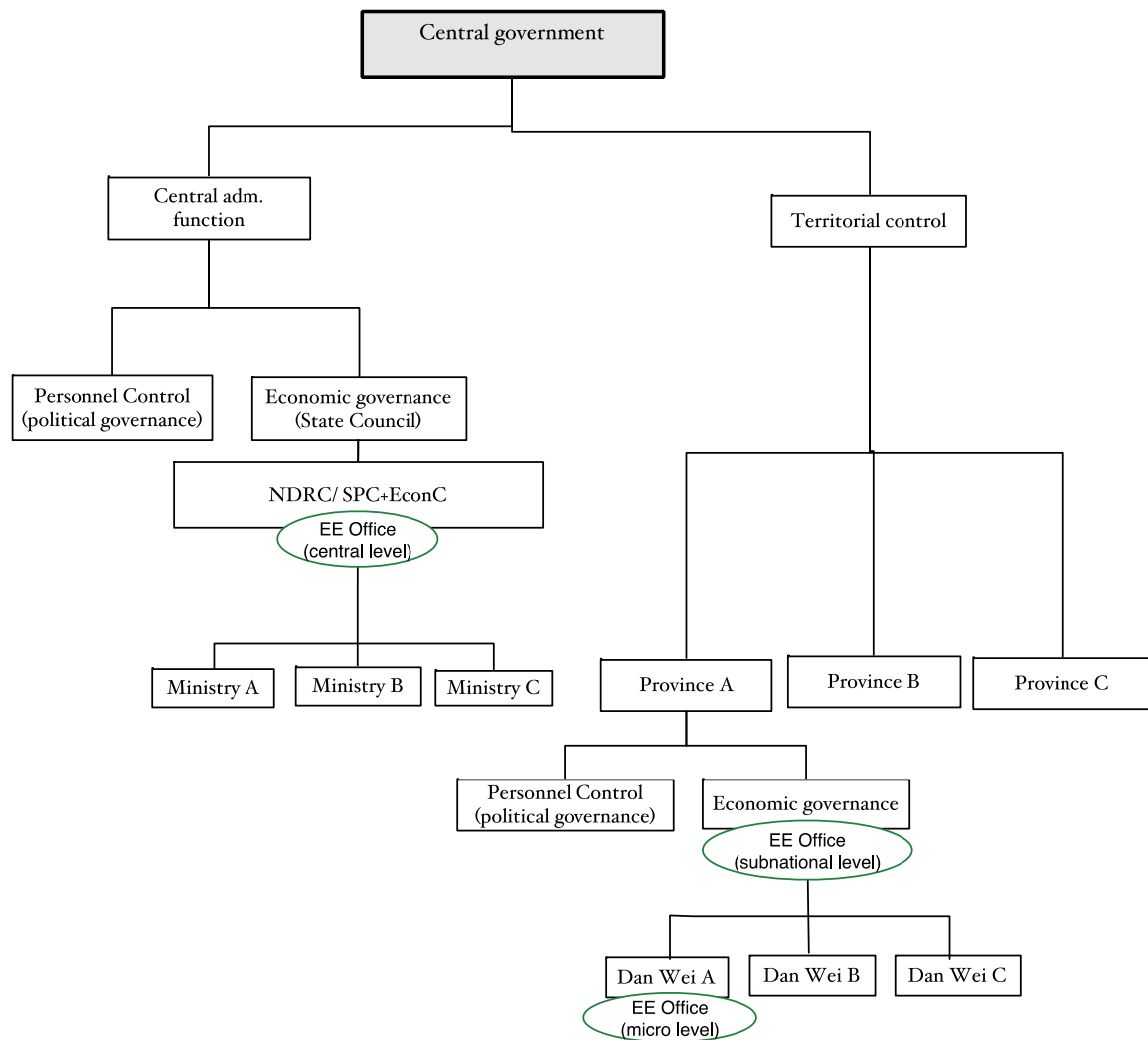
⁵⁵ Guidance, or *Tiao Li* is regarded as legal administrative regulation devised by the State Council, in purpose of comprehensive and systematic direction for a certain area of economic/social activity; it enjoys quasi-legislation status (Zheng, 1997, p143-144). Guidance planning was the typical planning tool of China in the 1980s (Naughton, 1990).

mode of short-term fragmented policies into governance through holistic long-term EC/EE planning and management. Furthermore, the EC Guidance of 1986 formalized the internalization in, and reliance of EE governance on, national and subnational economic governance. In the section of “Energy Management System” of the Guidance, it clearly states that the “State Council should institutionalize the EC Office to research, plan and devise EC strategy, policy and regulation; actual coordination and regular works are to the subject of SPC and EconC”, “Each level of the subnational government should set up an EC Office accordingly”, and “Every energy consumption *Dan Wei* should establish an EC responsibility system”. As shown in Fig. 3, EE organizations developed as an internal part of the national, subnational and micro economic governance structure. This embedded structure established the model for China’s EE governance for the future 20 years. As the time develops, more sophisticated and holistic EE governance was developed centred by this basic governance structure.⁵⁶

Figure 3.3 The bundling structure between EE and the Economic Governance Structure of China (Developed by the author based on the stylized RDA structure in Xu [2011]).

⁵⁶ See Qi (2012, 2013, 2014) and Andrews-Speed (2012) for the sophistication of EE governance.

Stylized EE under Economic Governance Structure of China



3.3.3 Institutionalizing EE within “Growth-at-any-cost”: A Fragile Equilibrium

Compared to India, the first critical juncture of EE development in China, though formed at a similar point in time, was driven by entirely different kinds of crises. Being an energy self-reliant country and a net oil exporter in the 1970s, the international oil shock did not threaten China’s energy security to the same extent as it did India’s. Rather, it was the domestic political and economic turmoil after the Cultural Revolution that forced China to address EC as an immediate and important step in restoring national economic order. Consequently, EC/EE organizations

gradually developed as an integral component of economic governance. The State Council EC Guidance 1986 strengthened this connection between EE and economic governance. In 1997, the Energy Conservation Law that was developed from the 1986 Guidance, further formalized that “EC planning is integrated into the national economic and social development planning”.⁵⁷ The de facto institutionalization of EE within the economic governance structure that had gradually developed from the first critical juncture was recognized and legalized by all.

The first critical juncture of China’s EE development was created, sustained and evolved closely along with the great economic reform of contemporary China which started in 1978. Subsequently, China’s EE regime inherited the crucial logic of this process leading directly to the “China Miracle”: growth is a matter of Life or Death (Xu, 2011). The paramount growth granted strong incentives and indisputable legitimacy to the development of all the institutions, governance structures, organizations and policies that serve this goal. During the early stages of its development EC/EE well served this objective. Given the stagnated energy reform, curtailing the energy consumption by urgent means was the most effective, immediate, and the only way to tackle the serious energy shortage that increasingly threatened China’s economic development during the 1980s.

China’s distinctive political economy made this possible. Since 1949, China developed a strictly planned economy under the communist rule. Although a relative failure in terms of economic development then, China was ironically successful in exercising a rigid quota system that controlled all essential resources for life and

⁵⁷ See Chapter 5, Energy Conservation Law of PRC (1997).

production at all levels of society, such as food, transportation, raw materials for industrial production, etc. The initial EC efforts made by the state naturally adopted the existing licence-based quota system: “Control the energy supply just like the food supply!”.⁵⁸ Later, based on the paradigm of the quota system, the target-implement-penalty mode of EC management was developed with several urgent Official Notices in the early 1980s. *La Zha Xian Dian* was the typical exemplar of this mechanism. The sharp decline of the energy intensity in both overall economy and the industrial sector in the 1980s proved its effectiveness.

However, this success in the early phases of EE development could not address the potential danger that emerged from this fundamental institution. When EC/EE was in compliance with the prior goal of economic growth, the system works well; but when it conflicts with the growth-at-any-cost ideology, does it work? Such a conflict of interest between economic growth and EC in the short term is universal and almost unavoidable for a mature economy. During the 10th FYP (2001-2005), in the immediate aftermath of China’s joining the WTO, China’s economic growth reached an unprecedented 11%. However, reversing two decades of decline, China’s energy intensity (both industrial and overall) increased (Fig. 1 and Fig. 4). On the one hand, the significant economic growth showed the effectiveness of economic governance. On the other, the entangled EE governance failed to meet its target. The balance between the “growth-at-any-cost” institutions and the EE governance within the larger economic governance appeared to be fragile. EE was apparently “a cost” of the “at-any-cost” institution of growth before the second critical juncture occurred in mid and late 2000s.

⁵⁸ “*Xiang Kouliang Yiyang Guanqilai* (像口粮一样管起来)”. See State Council EC Notice (1977).

Figure 3.4 China's overall energy intensity in the first Critical Juncture

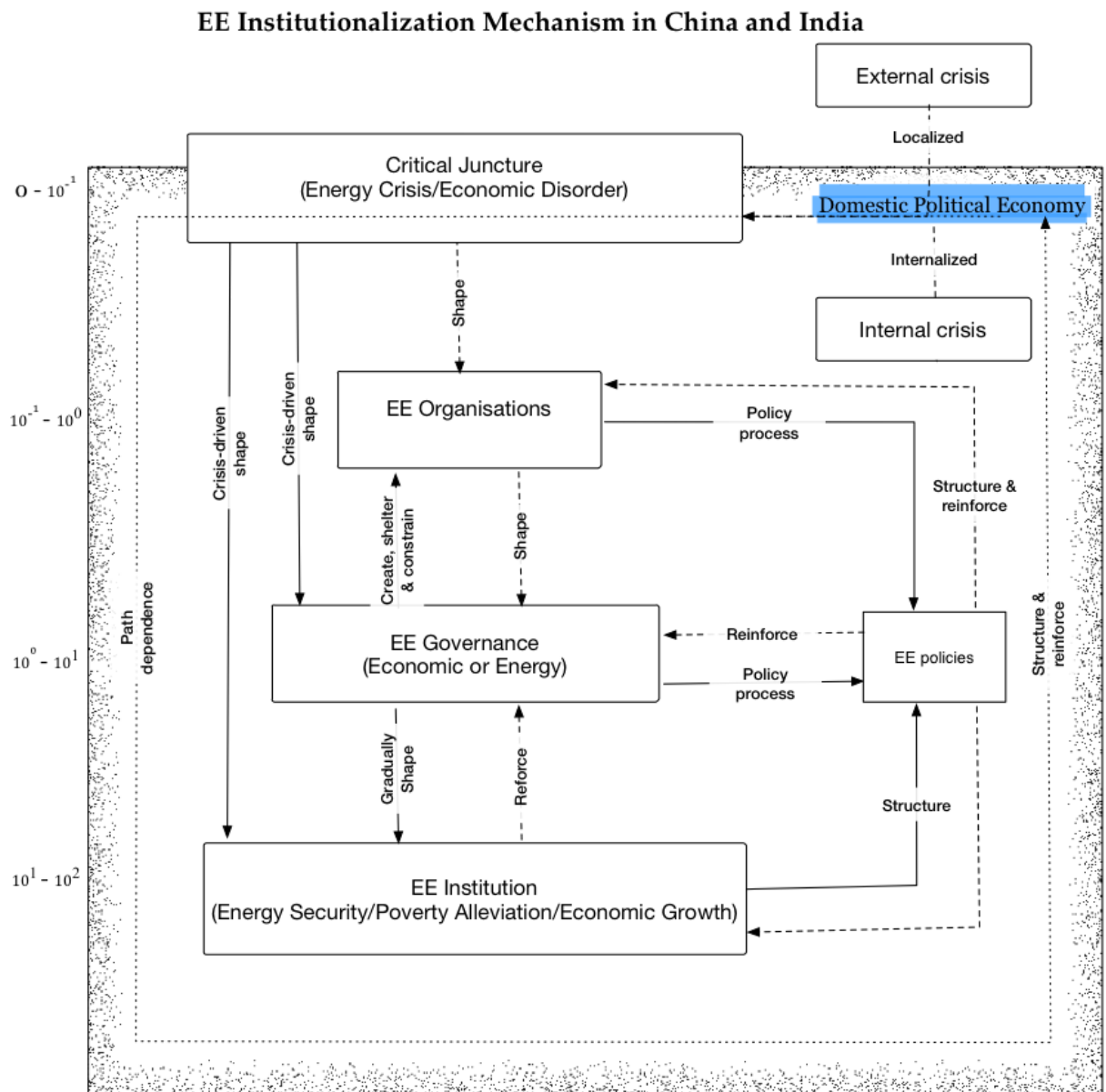


Source: EIA.

3.3 Discussion

The analysis of the first critical juncture of China and India's EE institutionalization shows a complex relationship between external/internal crises, existing energy/economic governance, newly developed EE organizations, and the fundamental institutions of the given political economy of China and India in that particular period of time. This multi-layered interaction between the above critical players formed a self-reinforcing equilibrium through several path dependence processes. In the end, the initial EE institutions gradually emerged from it.

Figure. 3.5 EE institutionalization mechanisms emerged from the first critical juncture



Note: Developed by the author based on Williamson (2000)

As shown in Fig. 3.5, in a given political economic environment, an external or internal crisis will be internalized, and then translated into the need for EC/EE in the domestic context. In India, the international oil crisis triggered the oil sector to consider EC/EE as important means of enhancing national energy security; while in China, the urgent need for economic stabilization after the Cultural Revolution made the government tackle EC/EE as the most immediate and effective way to mitigate the

severe energy shortage. The effect of the crisis usually happens immediately, which is in a time frame of $0 - 10^{-1}$ year (Column1 Flow 1 in Fig. 3.5).

Different crises trigger the different contexts of the critical juncture, which lead to EE diverging into distinctive organizational development pathways in the given governance structure. In India, because the EE discussion was initiated by the oil sector, its initial EE organizations developed under the framework of the governance of oil, later expanded into the broader energy governance structure, and was finally constituted in that of the power sector. In China, EC/EE was internalized under the decentralized economic governance structure from the very beginning, thanks to the economic stabilization drive characteristic of EC/EE management in China. The creation of single organization usually takes less than a year, so is in a time frame of $10^{-1} - 10^0$ year (Column 1 Flow 2 in Fig. 3.5).

The existing governance structures imprint their own modes of operating on the newly developed EE organizations through path-dependence and self-enforcing processes; by doing so, the present institutions fundamentally shape the institutionalizing process of EE. In India, energy governance embeds a pair of crucial ideologies - “energy security” and “poverty alleviation” – into the lately created EE organizations. By doing so, the institutions within which EE is embedded re-enforced their own importance - and higher priority over EE governance. Therefore, in the process of transplanting the hosting governance’ institutions into EE, energy governance strengthened its already dominant status over EE governance. Remaining in a weak position had effectively prevented a full-fledge development of EE in India.

By contrast in China, EE governance inherited the single most important institution of economic governance – “growth-at-any-cost”. This institutional path-dependence became a double-edged sword: when EE was compatible with the economic growth priority, EE governance greatly benefited from effective economic governance; however, when the two conflicted in the short-term, the efficiency of the hosting governance would decouple with and put aside EE in an “immediate and effective” way. This process re-enforced the dominating-supplementary power structure of the economic-EE governance structure. The process of governance formation in this case takes around a decade, which is shown as 10^0 - 10^1 year in Column 1 Flow 2 of Fig. 3.5.

As a result of those self-reinforcing processes, the fundamental institutions of EE gradually developed and legalized differently in China and India. In India, the Energy Conservation Act in 2001 provided legal backbone for an approach to EE focused on the market with limited governance; meanwhile in China, the Energy Conservation Law 1997 formalized the target-implement-penalty EE paradigm realized through EE organizations affiliated at every level of economic governance. In both China and India, this institutionalization process took around 20-25 years, therefore is in the time frame of 10^1 - 10^2 years (Column 1 Flow 4 in Fig. 3.5).

The complex and multi-layered interaction between triggering crises, existing governance structures, emerging organizations and fundamental institutions formed the dynamic mechanism of EE institutionalization in China and India during the first critical juncture. The distinct political economic environments of China and India sustained this process. In India, its high dependence on imported oil, especially the

dangerously high oil import bill compared to the limited foreign-exchange reserves, stagnated energy reform as well as a context of “pro-development” parliamentary politics, together provided motivations for continuously manipulating the institutional imprints of “energy security” and “poverty alleviation” into the “market force” narrative for EE. In China, the dysfunctional power governance, the legacy of a strict planning economy (the quota system), the decentralized economic governance structure, as well as the authoritarian political system had generated the target-implement-penalty mode of EE and constantly fueled the strong connection between EE and the wider economy.

The first critical juncture of China and India’s EE institutionalization overlaps with the vital economic reforms that took place in both countries from the late 1970s. The economic and political changes brought by the relatively successful reforms were also important agents in their institutionalization of EE. In India, the economic reform in the 1980s unleashed strong incentives for industry to improve production efficiency. The profit-driven and self-driven EE initiatives made by individual industries provided the government with an excuse to escape the responsibility of building a strong EE governance - which again reinforced the institutional equilibrium of EE. In China, the economic reform started in 1978 that led to China’s economic growth miracle made evident the severe energy shortage. The government had no other choice but to shift the temporary EC control into long-term EC/EE management. The State Council EC Guidance of 1986 formalized and quasi legalized the EE institutions that had developed through the interaction between crises, governance and organizations. By doing so, the increasing energy demands brought by the economic reform re-enforced the existing EE institutional equilibrium.

Nevertheless, contemporary Chinese and Indian political economy are characterized as fast-changing and internationally-connected. Economic liberalization and globalization have strengthened the mutual exchanges between “emerging markets” and the global political economy. Such international changes have significant implications to China and India’s domestic political economic environment, and further to their EE development. In the 21st century, the international climate change negotiations, together with the coincidental financial crisis broke the institutional equilibrium in many aspects of EE development. The challenge to the existing institutions formed the foundation for the second critical juncture of EE institutionalization in China and India to happen in mid 2000s.

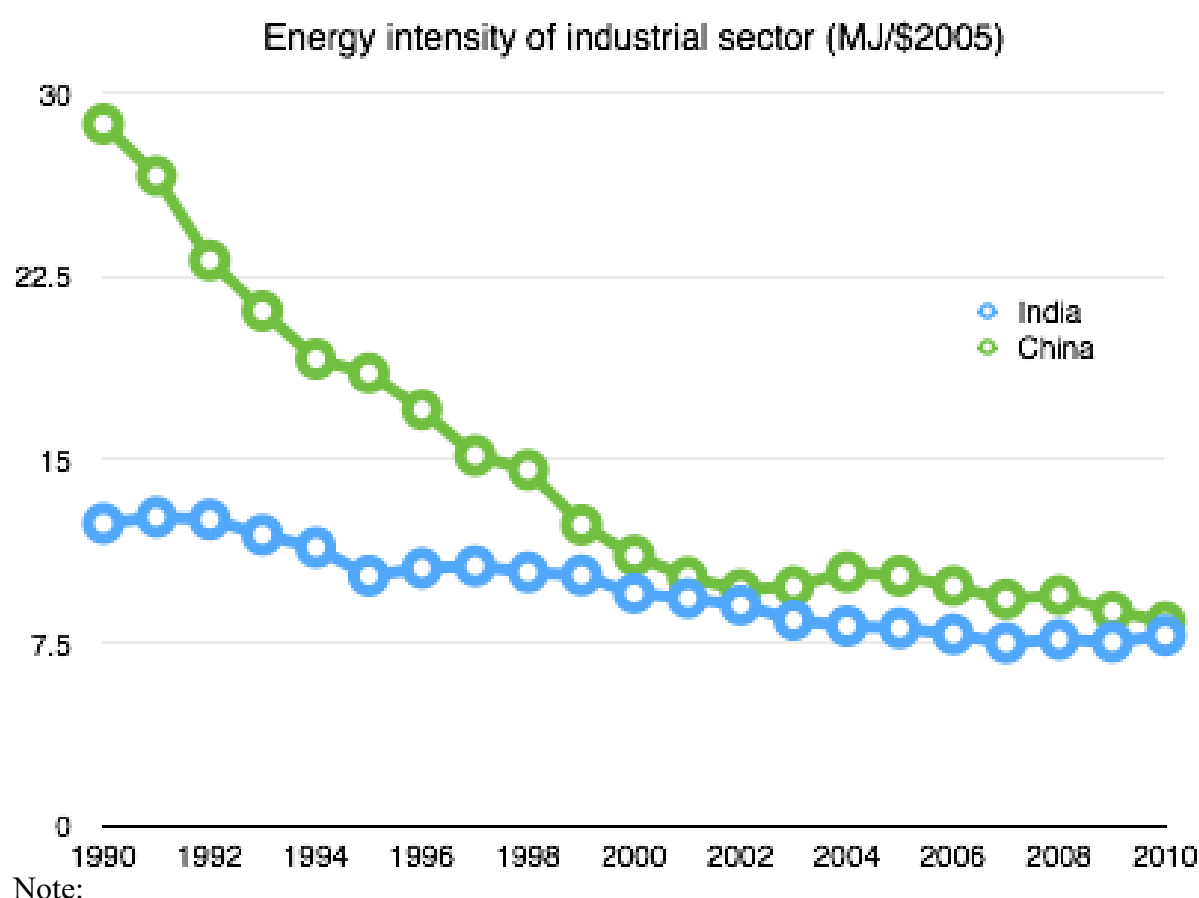
3.4 Conclusion

The chapter finds that self-reinforcing “equilibrium” between the critical players was formed during the first critical juncture of China and India’s EE development. The equilibrium led to the formation of the initial EE institutions in the two countries: in India, EE is believed to be realizable without government subsidies and with weak status for EE governance; in China, EE is realized through the target-implement-penalty mode as long as the EE agenda complies with the economic growth target. It also finds that the distinct political economy of the Chinese and Indian economic reforms started in the 1980s provided rich soil to sustain the complex of self-reinforcing path-dependent processes for EE institutions. The chapter has therefore argued that the fundamental EE institutions emerging from the first critical juncture have a long-term impact on the EE development of China and India.

The analysis of this chapter also mapped out a comparison of China and India's EE development under the institutions-governance-organizations framework. The comparison clearly shows that the differences between China and India's EE development pathways are deeply rooted in the distinct triggering crises, existing governance structures, newly developed organizations, and political economic environments. Their divergence started from the very beginning. This exercise contributes to the emerging literature on China-India comparisons (of EE and broader LCD areas in this case), which use a historical and institutional perspective. The policy recommendations emerging from the existing comparative literature tend to teach lessons generated from one to the other. My analysis shows that without a holistic and nuanced understanding of the origins and development of the fundamental EE institutions in China and India, such "lessons" carry little practical meaning for future policy making in both countries. The increasingly popular policy-oriented research on China and India's EE realization and their transition to Low Carbon Economy cannot solidly take root without this crucial aspect of grounded political historical comparison.

At the same time, despite the distinctive differences started from the triggering crisis to domestic political economy, the interactions between the critical factors of EE institutionalization are similar in both countries. The fascinating tension between similar mechanisms and the different content of the critical players has a long-term impact to EE development of China and India into the 21st century, which we will turn to in the next chapter.

Figure 3.6 Energy intensity of industrial sector in China and India (1990-2010)



1. Data source: World Bank and International Energy Agency (IEA Statistics © OECD/IEA, <http://www.iea.org/stats/index.asp>).
2. Energy intensity of industrial sector (MJ/\$2005): A ratio between energy consumption in industry (including energy industry own use) and industry sector value added measured at purchasing power parity. Energy intensity is an indication of how much energy is used to produce one unit of economic output. Lower ratio indicates that less energy is used to produce one unit of output.
3. Data is only available for the period of 1990-2010.

Table 3.1: Major Steps of China and India's EE development in the first critical juncture

	China	India	Backgrounds
1970s	1977 Central Committee of CPC: official Documents commanding strict quota system of energy consumption management; 1978 State Council: Official Notice on License Based Quota System of Fuels and Electricity.	1970 Fuel Policy Committee: oil and coal efficiency in electricity generation; 1976 Petroleum Conservation Action Group: awareness raising and capacity building; 1979 Working Group on Energy Policy: energy conservation and management.	The world oil crises, India was a net oil importer while China was a net oil exporter; Severe energy shortage, poverty and weak economy in both countries; EC/EE came into the policy agenda.
1980s	1980 - 1982 State Energy Commission: centrally coordinating energy conservation; 1980-1982 State Council: Three Energy Conservation Instructions on Quota based fuel and electricity conservation management; 1985 - 1991 Inter-ministerial Working Group on Energy Conservation: facilitate energy conservation and management in all levels of the government – target management, research, and capacity building; 1986 State Council: Energy Conservation Management Guidance (quasi EC law) – requiring sub-national EC management system to set up.	1981 Inter-Ministerial Working Group on Utilization and Conservation of Energy: first-ever concrete proposal for reducing energy consumption; 1983 Advisory Board on Energy: draft of Energy Conservation Bill (1986); 1989 Energy Management Centre (set up as a registered autonomous center under Ministry of Power).	Economic reform started in both countries; Fuel and electricity shortage escalated; EE focused on industry.
1990s	1993 Agenda for the 21st Century (with UN, WB and multi-national collaboration): public awareness raising of EE; 1997: Energy Conservation Law – Integrating EE into social and economic planning in all levels of the governments; EE target, finance, and capacity building	1989-1995 India-EC Energy Bus: Energy Audit for industries; 1991: National Conservation Day/Award; MoEF with CPCB, BIS: Eco-Mark; 1994 USAID-NTPC launched CenPEEP: energy efficiency of	Deepening of the economic reform: signaled as the 1991 liberalization package in India, and 1992 Deng Xiaoping's Southern China Tour Speeches in China;

	(R&D).	thermal power; 1997: Voluntary energy efficiency standard	Fast economic growth, increasing foreign collaborations on EE; EE still focused on the energy and industry sector. Other areas remained voluntary in regulation and reluctant in implementation.
2000-2005	Stagnation: governance vacuum, energy intensity increased.	2001 Energy Conservation Act: constituting BEE, with support from USAID in 2002; Organizational capacity building, negotiation with various stakeholders.	China joined WTO, deepening of globalization, continuation of the foreign collaborations; Setting EE standards while implementation remained weak.

CHAPTER 4. CHINA'S SECOND CRITICAL JUNCTURE

Until the early 2000s, both China and India formally institutionalized their development of energy efficiency by passing legislation and creating dedicated central government agencies. The first Energy Conservation Law in China (1997) and in India (2001) marked the end of the first period of EE institutionalization. The institutions formed from the first critical junctures of EE development have a long-term path-dependent impact. Yet they also keep on evolving along with the economic and political changes, both domestically and internationally.

Two series of global events with domestic consequences became triggers of the second critical juncture of EE institutionalization in China and India: the International Climate Change Negotiations (ICCN) and the international financial crisis.

Around 2006, the strong pressure from ICCN pushed China and India to respond to the climate challenge by making more concrete promises about low-carbon development. The need for EE development was no longer merely a natural reaction to their domestic energy and economic crises, but also a response to international pressures on China and India's accelerating energy consumption and carbon emissions.⁵⁹ Despite their reluctance, the Chinese and Indian governments had to take some actions in order to respond to such pressures that come from both the domestic and international spheres. EE thus became an important part of the domestic policy packages that resulted. Later, in early 2008, the international financial crisis broke out, which adversely affected the then export-oriented Chinese and Indian economies.

⁵⁹ The detailed explanations of the Chinese and Indian governments reactions in ICCN are laid out in section 4.1 and 5.1.

Their response to the economic crisis – a massive stimulus package in China and fiscal austerity in India – impeded and/or manoeuvred the original EE and climate policies in various ways, and shaped the future development path of their EE institutions. The combined consequences of the two international events triggered the second period of China and India's EE institutionalization.

Nevertheless, although China and India faced same external crises during this period, their distinct political and economic conditions contextualized the triggering events in different ways. So did they make different impacts on the following phases of the political conceptualization of EE policy fields, as well as the detailed policy processes?

In the following two chapters (Chapter 4 and Chapter 5), through the five-phase analytical framework I analyze how these two global events affected China and India in divergent ways, yet resulted in converging EE institutions. To do so, I examine how the critical players reacted to those triggering events and the consequent political negotiations. I then map out in detail how the EE institutionalization processes in China and India evolved due to the pressure from the ICCN and in the background of international financial crisis.

This chapter is particularly focused on China in the second critical juncture. The structure of the chapter is as follows: section 4.1 addresses the connection between the ICCN and China's domestic EE target; section 4.2 maps out different government actors' response to EE strategy; section 4.3 discusses the economic rationale of China's ambitious EE target in the second critical juncture; the following section 4.4 examines in detail the major institutions involved in realizing EE targets during this

period; then I discuss the institutionalization process of the economic implementation logic of EE strategy (4.5); I finally conclude the chapter with a summarize of arguments and link them to following chapters (4.6).

4.1 The political contextualization, conceptualization and policy timing of EE

The first and second phases of China's EE development during this period showed the policy field for EE being conceived and placed in a context between international and domestic politics.

4.1.1 Responding to the ICCN and promising the “20%”

China started to face continuous pressure from the ICCN in the 1990s. In 1990, China established a Coordination Committee on Climate Change under the China Meteorological Administration. In 1998, this was replaced by the newly set up National Coordination Committee on Climate Change under the administration of NDRC.⁶⁰ This administrative transfer sent a strong signal: climate change was perceived by the Chinese government as a development problem rather than merely an environment and meteorological issue (Zhang, 2013). In addition, NDRC enjoys much higher policy power compared to the Meteorological Administration. The replacement was also a positive response to the accelerating ICCN pressure for China to cut its GHG emissions.

Around the late 1990s to early 2000s, despite the accelerated pressure from the developed world, China still insisted on its position with other “like-minded states” that it would not make a binding commitment before reaching the level of a middle-

⁶⁰NDRC was the overarching and most powerful policy-making and regulating government agency, while the Meteorological Administration was a professional administration that provided research and consultancy rather than decision-making.

income developing country. Yet due to the concerns of both the international image and domestic economic adjustment that will be elaborated in details in section 4.1.2, around 2006-2007 (COP-13), China's attitude towards ICCN began to change (Wu, 2013a, Zhang, 2013). It agreed to take Measurable, Reportable and Verifiable (MRV) mitigation commitments or actions that are nationally appropriate (Zhang, 2013). In addition, China became more flexible and practical in terms of international cooperation on climate change: it showed more willingness to pursue a "win-win" situation with both the developed and developing countries in terms of technology transfer and financial mechanisms (Zhang, 2013).

Around the same period, in 2005-06, China announced its unprecedented and ambitious EE target: to reduce domestic energy intensity by 20% during the 11th FYP (2006-2010). The time sequence of those international and domestic events showed a strong connection between ICCN's pressure and China's domestic EE promise.

4.1.2 An analysis of timing

As Pierson (2004) argued, timing and sequence matter greatly for institutional development. Timing or conjuncture in Pierson (2004) refers to "the linking of discrete elements or dimensions of politics in the passage of time" (p. 55). An intensive period between the year of 2005 to 2007 triggered the second critical juncture of China's EE institutionalization process. Unpacking the conjuncture of events in 2005-7 reveals a strong causal connection between the seemingly discrete events.

As shown in Table 4.1, before the 11th FYP was announced, China's promise on energy intensity reduction was in consistence with the Medium and Long Term Plan

for Energy Conservation (NDRC, 2004): an annual EC rate of 2.2% in 2003-2010, and 3% in 2010-2020. In March 2005, Mr. Liu Jiang, the Chinese ministerial representative to the G20 Energy and Environment Ministers' Meeting reiterated China's stance on EC. Yet a few months after, in late 2005, the Politburo announced a much higher EC target: to reduce energy intensity by 20% during the 11th FYP, which equaled to 4% per year. This ambitious target was then formalized in the 11th FYP that was officially published in March 2006.

What was the reason for the Chinese government to increase its EC/EE target to an unprecedented level within just a few months? A close reading of the policy documents already shows the strong connection between the ICCN pressure and China's ambitious 20% EE target, as it was clearly mentioned in the 12th FYP of Energy Conservation and Emission Reduction (ECER):

“The significant achievement of ECER in the 11th FYP...made important contribution to *global* climate change. We reduced GHG emission by 1.46 billion tonnes, which gained wide compliment from the international world, and showed a positive image of a responsible great power.” (State Council, 2012)⁶¹

The Senior official of the Research Office of the State Council, Mr. Fan Bi's statement, in response in my fieldwork interview in September 2013⁶² echoed the same:

“Before the announcement of the 11th FYP, China faced more and more pressure from the ICCN. As you know, from 2001 to 2005, after joining WTO, economic growth accelerated dramatically but our energy intensity and overall energy consumption was increasing as well. It reversed our record of rapid decline in energy intensity since the 1980s.⁶³ The international world just pounced on this fault and never let it go (*Jiuzhu*

⁶¹Author's italics.

⁶²Location: Haidian District, Beijing.

⁶³The 10th FYP (2000-2005) set a target of 15-17% reduction in energy intensity. But during this period, the energy intensity increased by 11.1%, while the GDP grew at an annual rate of 9.5%.

Bufang 揪住不放). What they were arguing about was anyway a fact. As the Chinese economy kept growing, the developed countries asked us to make more commitments to climate change. For those years' ICCN COPs, we felt like there was no escape. It suddenly became a matter of *face* (*lian'mian* 脸面). China's international image is a vital thing to the government. So Premier Wen Jiabao asked the NDRC to show some bolder actions. The NDRC started to think of some more ambitious numbers for the 11th FYP than the Medium and Long Term EC Plan. Later on, the number '20%' was produced. Within such a short time, a very scientifically evidenced number was not possible. There was only one request from the top: *showing our strong will.*"

This statement from Mr. Fan Bi's answer exposed another crucially important but seldom revealed information: the EE/EC target of 20% which shocked both the world and the country for its ambition was more of an instant reaction to the top leaders' concerns for China's international image (face) than a carefully calculated plan. Such interpretation from a senior policy insider, on the one hand resonates with the scholarly argument that the international pressure on climate change formed a reverse trigger for domestic reform in China - a *Daobi* (倒逼) mechanism (Wu, 2013a). On the other hand, it seemed to contradict the commonplace understanding of China's impressive EE planning in response to the severe climate change challenges: the exact number of "20%" was more symbolic than scientific. Nevertheless, this sharply raised number of 20% from the original 11% (2.2% annually) in the Medium and Long Term EC Plan, indeed sent a strong though somewhat contradictory signal to the international world as well as to all sectors of the central government.

Table 4.1 Timing of China's key EE policies during the second critical juncture

Time	Policy documents/ Events	Responsible agency	Main content
Nov 2004	Medium and Long Term Plan for Energy Conservation (FaGai HuanZi [2004] No. 2505)	NDRC	“This Plan, covering a time span that consists of the 11th FYP and the time period between 2010 and 2020, details the energy conservation objectives and development priorities by 2010, and sets out the objectives to be achieved by 2020”, “China’s energy consumption per 10,000 yuan GDP will be reduced from 2.68 tons of standard coal equivalence in 2003 to 2.25 tons of standard coal equivalence in 2010, and to 1.54 tons of standard coal equivalence in 2020. Meanwhile, the annual energy conservation rate will reach 2.2% in 2003-2010, and be lifted to 3% in 2010-2020. ”
March 2005	G20 Energy and Environment Ministers Roundtable meeting The Kyoto Protocol came into effect, UNFCCC was in effect for 10 years.	Speech by Mr. Liu Jiang, Vice-chairman (Minister level), NDRC, “The Challenge of Climate Change and China’s Response Strategy” ⁶⁴	“The Chinese government has formulated its energy development strategy focusing on the following aspects: giving priority to energy conservation, adjusting energy structure, realizing energy diversification, enhancing environmental protection, upgrading technology and encouraging innovation.” “To mobilize efforts from all sides of the society and to turn back the tendency, our government issued the Mid-to-Long Term Special Plan for Energy Conservation in November 2004. The plan specifies... (same as above).”
March 2006	11 th Five Year Plan ⁶⁵	State Council	“Significantly promote efficiency of resource utilization. Reduce around 20% of energy intensity (2006-2010).”

⁶⁴The speech is available on the Chinese government website: <http://en.ccchina.gov.cn/Detail.aspx?newsId=38497&Tid=98> [last assessed 17 June 2015].

⁶⁵See the Chinese government website: http://www.gov.cn/ztl/2006-03/16/content_228841_2.htm [last assessed 17 June 2015].

June 2005	The State Council Decision on Strengthening Energy Conservation (Guo Fa [2006] No. 28)	State Council	“Guiding ideology: taking the improvement of energy efficiency as the key channel to transform the economic growth mode, adjust the economic structure and accelerate the technological advancement...The principal role of market-based allocation of resources shall be brought into full play. The consciousness in energy conservation among the main market players shall be mobilized.” “Main target: a reduction of energy intensity of around 20% as compared to the end of the 10th FYP period, with average annual rate of energy conservation of 4.4%.”
April 2006	Top-1000 energy-consuming enterprise program	NDRC	Identified 1000 energy consuming enterprises and gave EC target to each of them.
Sep. 2006	Reduced export tax rebates for many low-value-added but high energy-consuming products	NDRC and Ministry of Finance (MoF), (Cai Shui [2006] No. 139)	
Oct. 2006	Implementation measures of 10 key projects in 11th FYP	NDRC	Identified Ten- Key EE Projects in industry and buildings sectors. The expected impact of these ten projects is about 40% of the 11th FYP target, which equals to a reduction of 4250Mtce/year. In terms of implementation, the central government financed 20 provincial energy conservation centers (ECCs). In 2006, the financial support ranges from 2.4 million RMB to 4 million RMB (Zhou et al, 2010).
May 2007	The State Council Comprehensive Plan on Strengthening Energy Conservation and Emission Reduction	State Council	To implement Energy Conservation Target Responsibility System (ECTRS): the realization of the energy intensity reduction plan should be integrated to the evaluation system of cadre and SOE managers, which shall be veto criteria.
June 2007	China's National	State Council (Guo Fa	First national climate change plan in developing countries.

	Climate Change Plan	[2007] No. 17)	
Oct. 2007	Revision of the energy conservation law	National Congress	Legalized ECTRS.
Nov. 2007	Energy Intensity Statistic System Implementation Plan ⁶⁶	Bureau of Statistics, NDRC	Establish a national statistical system for energy intensity.
2007	Interim administrative method for incentive funds for heating metering 2007 and EERERB (Energy energy-efficiency retrofit for existing residential□ buildings) in China's northern heating area	MOF	Introduced incentive schemes for household heating conservation.
Dec. 2007	ICCN COP-13, Bali		

⁶⁶ See the Chinese government website: <http://www.mofcom.gov.cn/article/bh/200802/20080205391300.shtml> [last assessed 17 June 2015].

Since the announcement of the 20% target in the 11th FYP, a series of EC/EE policies were produced, including the flagship EE schemes of the Top-1000 Energy Consuming Enterprise Program, the 10 Key EC Project, the export tax reduction for low-value-added but high EE products etc.⁶⁷ Following those specific policies, in June 2007, right before the COP-13 in Bali, the State Council announced “China’s National Climate Change Plan”. The Chinese Premier Wen Jiabao proudly said in his speech in the COP-15 afterwards (18 December, 2009, Copenhagen): “China is the *first* developing country to have and to implement a ‘National Climate Change Plan’”.⁶⁸ This again revealed the substantial connection between China’s suddenly enlarged domestic EE and climate plan and ICCN pressure.

4.2 Initial resistance in realizing the “unrealistic 20%”

Although the Chinese government was eager to show the world its strong will and bold actions to strengthen domestic EC/EE, this message of an ambitious “20%” was not received well by local governments, and in the real economy according to the central government. Several local officials expressed similar opinions during fieldwork interviews: “No one was taking it seriously – just another piece of political propaganda, totally irrelevant.” Despite the fact that the whole country entirely failed to achieve the target of 15-17% reduction in energy use per unit of GDP during the 10th FYP (2000-2005), and energy consumption grew even faster than GDP between 2002 and 2006 (Zhou et al, 2010), no responsible officials, from the top to the local levels, were punished for this failure. As Xu (2011) argued, by 2005, local competition for higher economic growth and growth-at-all-cost had already been institutionalized inside China. The vital task for all levels of government was

⁶⁷Outline of those key policies are shown in Table 4.1.

⁶⁸ *Italic added by the author.* The speech is available on the Chinese government website: http://www.gov.cn/ldhd/2009-12/19/content_1491149.htm [last assessed 17 June 2015].

economic development. The same logic made local officials interpret the EC/EE plan for the 11th FYP as yet another rhetoric of the central government “to show to the foreigners” (*gei waiguoren zuozuo yangzi* 给外国人做做样子).

4.2.1 Local government’s negative self-reinforcement towards EE target

I have argued in the previous chapter that during the first critical juncture, China’s EE organizations were established within the structure of economic governance, and the EE agendas were closely allied with the economic developmental goals. When EE development aligned well with economic objectives, it was successful (1980s – late 1990s). But when economic growth conflicted with EE promotion, EE governance proved to be ineffective (2000-2005). This embedded institution, EE governance, had a crucial influence on the thinking and behavior of local cadres and managers of major industries – the actual agencies for implementing EE policies. Their reluctance to accept the 20% new target was a reflection of the contradictions in EE policy. Meanwhile, those hesitant agencies were also the active shapers of EE institutions - their perceptions and actions reinforced the already-institutionalized weak priority of EC/EE in the fast-accelerating Chinese economy during the era of rapid globalization. A negative process of institutional self-reinforcement for EE development was already forming before the announcement of the 20% target, which significantly impeded its smooth implementation.

Moreover, the target itself was made in disconnection with reality: NDRC explained in the 11th FYP that the 20% reduction goal was made based on an annual economic growth of 7.5%. In fact, the Chinese economic growth was already growing at an annual rate of 9.5% between 2000 and 2005. Between 2005 and 2007, before the 20% target was put forward and before the Comprehensive Plan for Strengthening ECER

was announced, economic growth ranged from 10.7% to 11.4%. The higher economic growth required a substantially higher energy saving to meet the 20% target. According to Feng (2007), 700Mtce of energy reduction was required according to a 9.5% of economic growth and 670 Mtce for 8.5%, while only 640Mtce was needed for a 7.5% economic growth rate.

This apparent disconnection between the EC target and economic growth further reinforced the actual agencies' initial resistance to implementing the "20%". One local official in Ningbo city on the eastern coastal areas said during a fieldwork interview in August 2013:⁶⁹

"We were assigned a provincial 20% target after the national 20% goal was announced in 2006. The number was still 3% of annual reduction in 2005 and it became 4% in a few months' time. Even 3% was not possible. The economy was growing far faster than the assumed 7.5%, and the Central government knew it very well. Real estate was booming, export was growing, manufacturing was expanding...this target was just not realistic. The Central government couldn't have been that serious. This 20% target was seldom mentioned in our daily work during 2006-2007."

Consequently, in 2006, the first year of the 11th FYP, China barely managed a 1.23% of energy intensity reduction, which is far below the annual 4% reduction required for a total target of 20%. This figure was revised to 1.69% in 2007, and finally revised to 1.79 in 2009 by the government without giving specific reasons (Zhou et al., 2010).

4.2.2 Central Government's response

The central government was alert to what was going on in reality. As opposed to its ambivalent attitude towards EC/EE target during the 10th FYP, the government seemed to be rather determined to achieve the 20% target for the 11th FYP. In May

⁶⁹Location: The Economic Commission of *Fa Gai Wei* (the municipal branch of NDRC), Ningbo Municipal Government.

2007, one and half a year after the 20% of EE target was publicly announced by the Politburo, the State Council issued a Comprehensive Plan on Strengthening Energy Conservation and Emission Reduction (referred as ECER Comprehensive Plan). It criticized the ignorance of the local governments and enterprises in very harsh tones:

“Nowadays, achieving the ECER target **faces tough challenges**. Since last year, the whole country strengthened the ECER work; the State Council issued the Decision on strengthening EC, made and promoted a series of ECER policies and implementation programs; all areas and sectors of the government made working plans accordingly; ECER made some positive progress. **But**, last year did not achieve the ECER targets that were set in the beginning of the year, increasing the difficulty for ECER work during the rest 4 years of the 11th FYP. **Worse still**, the first quarter of this year saw a exceedingly high growth of industries, especially the energy and pollution intensive sectors (numbers)...at the same time, in all areas of ECER work, the recognition is **not adequate**, responsibility is **not clear**, implementations is **not matched**, policies are **not complete**, investments are **not grounded**, and coordination is **not effective**. If such situation can not be reversed immediately, not only will this year see difficulty to have significant progress in ECER, but also **the 11th FYP ECER target will be hard to achieve.**”

“当前，实现节能减排目标面临的形势十分严峻。去年以来，全国上下加强了节能减排工作，国务院发布了加强节能工作的决定，制定了促进节能减排的一系列政策措施，各地区、各部门相继做出了工作部署，节能减排工作取得了积极进展。但是，去年全国没有实现年初确定的节能降耗和污染减排的目标，加大了“十一五”后四年节能减排工作的难度。更为严峻的是，今年一季度，工业特别是高耗能、高污染行业增长过快……与此同时，各方面工作仍存在认识不到位、责任不明确、措施不配套、政策不完善、投入不落实、协调不得力等问题。这种状况如不及时扭转，不仅今年节能减排工作难以取得明显进展，“十一五”节能减排的总体目标也将难以实现。”

Following the strong determination showed in the ECER Comprehensive Plan, the central government issued a series of policies to enhance the implementation of the 20% target – policies that will be elaborated in the following sections. All of these showed, despite massive ignorance from the local governments, that the Central government was taking the ECER work and the 20% target very seriously. The following section

will examine the political logic behind these actions.

4.3 The multiple embeddedness of the “unrealistic target”

Why did the central government set an unrealistic target and insist on achieving it? To answer this question, we need to link the underlying economic and political rationales and the bundling structure between EE and economic governance that had developed from the previous period. The political negotiations and competitions between various policy groups made EE embody not just one, but a series of policy agendas needed for China during that period.

4.3.1 The economic adjustment agenda

Although the over-ambitious 20% EC target seemed to be a hurried reaction to the increasing ICCN pressure, the government’s strong determination to realize the target revealed its broader economic agenda. Since 2000, the Chinese economy was being driven by the “secondary industry”, meaning manufacturing industry and construction.⁷⁰ According to the World Bank (2006), China’s service sector accounted for merely 40% of GDP, which was even lower than in many developing countries. The Chinese government was still fixed in the mindset of *Ganchao* (赶超) – emulating and surpassing the OECD countries (Wu, 2013b). Having realized high economic growth, the next step in the Chinese economic agenda was to move higher in the industrial value chain and to become more profitable and competitive in global markets. The government then identified the service sector, rather than the industrial and manufacturing sectors to be the next area of focused economic development. As

⁷⁰The Chinese government classified three areas of economic activities: the primary (agriculture), the secondary (industry and construction) and the tertiary (transportation, residential and commercial).

explained in the “Guiding Principles” of the 11th FYP (March 2006):⁷¹

“(Economic development should) (f)ocus on **optimizing the industrial structure** in order to boost development. Taking economic structural adjustment as the backbone, to shift the economic growth from the industry-oriented and quantitative-expansion-oriented model to the optimization-and-upgrade-oriented one that is in coordination with the development of tertiary sector.

- Focus on **resource conservation and environmental protection** to boost development. Based on the nexus of the fundamental change of economic growth, shift economic growth from reliance on resources to efficiency promotion.”

“立足优化产业结构推动发展，把调整经济结构作为主线，促使经济增长由主要依靠工业带动和数量扩张带动向三次产业协同带动和结构优化升级带动转变。立足节约资源保护环境推动发展，把促进经济增长方式根本转变作为着力点，促使经济增长由主要依靠增加资源投入带动向主要依靠提高资源利用效率带动转变。”

In addition, the ECER Comprehensive Plan (May 2007) stated

“(Realizing the 20% energy intensity reduction target) is a compulsory choice for developing a **resource-conservative and environmentally-friendly society**; it is a must-do for pushing forward **economic structural adjustment and economic growth upgrades**.”

“是建设资源节约型、环境友好型社会的必然选择；是推进经济结构调整，转变增长方式的必由之路。”⁷²

That is to say, the government was aware of the urgent need to improve the economic structure, and that in order to aim for a more competitive economy in the global market, the ECER strategy was designed by the government as a nexus (*Zhuashou* 抓手) to realize a broader and long-term economic agenda: replacing energy intensive industries with the service and commercial sectors, which were more value-added and much less carbon intensive. In this way, a win-win situation of a more sustainable economy would be achieved.

⁷¹See the Chinese government website: http://www.gov.cn/node_11140/2006-03/18/content_230048.htm [last assessed 17 June 2015].

⁷²See the Chinese government website: http://www.gov.cn/zwggk/2007-06/03/content_634545.htm [last assessed 17 June 2015].

4.3.2 The need for political consolidation

In fact, the economic agenda that embedded the ECER strategy was more complicated than a pure economic structural adjustment. Having embarked upon 25 years of rapid industrialization and economic growth, the Chinese economy was facing many inter-related challenges. The ambition of ECER reflected the government's determination to solve the multiple economic problems under one policy umbrella that could suit both the international climate change expectations and domestic political and economic needs. As Mr. Fan Bi said in the same fieldwork interview:

“Although the figure 20% itself was not that scientifically produced, it did not come out of nowhere. People in NDRC are not stupid (*bushi chisu de* 不是吃素的). They are very experienced in planning and know exactly how to **balance different sectors and realize multiple developmental goals at the same time**. For the 11th FYP, the Central wanted to readjust the economic structure. At that time, we were already facing problems of **overcapacity** in some of the heavy industries.⁷³ The boom of economic growth since joining WTO led to the **disorder** of development as well. Thousands of small and medium sized companies in energy and related industries emerged, such as coal mining, steel, cement, glass production, and thermal power. They caused many problems for government regulation. They were also not efficient in terms of resource utilization as compared to the better-regulated larger-scale industries, either privately or publicly owned. The government wanted to **consolidate its regulatory power** over those areas by promoting the bigger and more advanced industries and removing the smaller and outdated ones. To do so, you can't just say: 'Go away, we don't need you anymore.' ECER was the right name (*mingtou* 名头): 'You don't meet the ECER standards. So sorry, it's time for you to step down from the historical stage.' **The higher-set the target, the more flexibility was left for the government to realize the multiple economic goals behind it.**”⁷⁴

In other words, the government did notice that the 20% of energy intensity reduction target was factually unrealistic; yet, the strategic and symbolic meanings it embodied were much more important than the actual figure and whether this figure was realistic or not. To some extent, the target was made to be “unrealistically ambitious” in order

⁷³Overcapacity is a constant problem faced by the Chinese economy and the LCD sector. See Yang (2011), Zhang et al (2013), and Liu and Kokko (2010).

⁷⁴ Emphasize made by the author.

to give enough manoeuvring spaces for the Central government to achieve altogether more fundamental economic and political agendas. Kostka and Hobbs (2013) argued that China used a strategy of “interest bundling” to realize the EE target – local officials bundled EE with various economic development interests in order to realize the EE target. In fact, such strategy of “interest bundling” was not an innovation of local officials. It originated from the top level – from central economic planning. It was primarily designed as a bundled policy scheme to realize economic, EE and even political (consolidating regulatory power) goals at the same time.

Two policies under the ECER strategy umbrella were particular examples of these multiply-embedded development goals:

- “Promoting the Big and Removing the Small” (*Shang Da Xiao Xiao* 上大下小) policy in thermal power: replacing small and low efficient thermal power generating units with above scale and high efficient ones.
- “Elimination of Backward Production Capacity” (*taotai luohou channeng* 淘汰落后产能): reducing the backward production capacity in steel, cement and other heavy industries and replacing it with larger-scale and more efficient ones.

These two policies were extremely successful and both exceeded the assigned targets.⁷⁵ Table 4.2 shows the distinct achievements of Promoting Big and Removing Small policy. The implementation of this policy was accompanied by comprehensive state support for enterprise Merger and Acquisitions (M&A). As a result, these industries were much more consolidated and only the larger-scale enterprises, which

⁷⁵Targets were given in the Guo Fa [2007] No. 15 document.

simultaneously had stronger connections with the government, survived.⁷⁶ Table 4.3 shows the significant consolidation resulting in coal, steel and cement sectors. By doing this, the government realized the twin goals:

1. Energy utilization efficiency in these sectors increased through adopting highly efficient equipment and removing smaller counterparts Qi (2011, p83-85);
2. State regulation was consolidated through financing and administratively promoting larger scale industries, strengthening the government's dominating leadership in resource allocation and removing the mass small and medium sized enterprises.

⁷⁶This will be elaborated in the following sections.

Table 4.2 Major energy intensive industries' increased scale of production capacity during the 11th FYP

Industry	Production Equipment Indicator in major industries (unit in total capacity %)	2005	2006	2007	2008	2009	2010
Thermal power	Above 300MW of generating capacity	43.4	50.4	61.5	65.2	69.4	71.3
	Above 600MW of generating capacity	11.7	/	25.6	31.3	/	36.4
Steel	Unit of above 1,000m ² furnace	20.6	20.8	24.8	30.0	/	39
	Unit of 300 – 999m ² furnace	59.5	65.7	64.0	64.7	/	/
	Unit of below 300m ² furnace	19.9	13.5	11.2	5.3	N	N

Source: adapted from Table 3-4 in Qi (2011, p. 82).

Table 4.3 Large scale enterprises in major energy-intensive industries during the 11th FYP

Industry	Scale of enterprise	2005		2020	
		unit	%	unit	%
Coal	Above 10 million tonnes	31	43.2	50	58.0
	Above 50 million tonnes	/	/	13	41.0
Steel	Above 5 million tonnes	19	51.5	27	73.0
	Above 10 million tonnes	8	29.8	13	54.3
Cement	Above 180 thousand tonnes	10	15.0	22	45.8

Source: adapted from Table 3-5 in Qi (2011, p. 83).

In short, economic and political concerns drove the government to insist on implementing a seemingly over-ambitious energy intensity reduction target of 20% for the 11th FYP. Such an economic and political agenda included: readjusting the economic structure, removing the outdated production capacity and consolidating regulatory power in major energy intensive industries. The results appeared to be effective in those areas. The importance of the 20% target was to fully motivate the entire country to achieve the multiple-goals that came with it. The exact number was more symbolic than scientific. As Mr. Fan indicated, “The higher the target, the more flexibility was left for the government to realize the multiple economic (and political) goals behind it”.

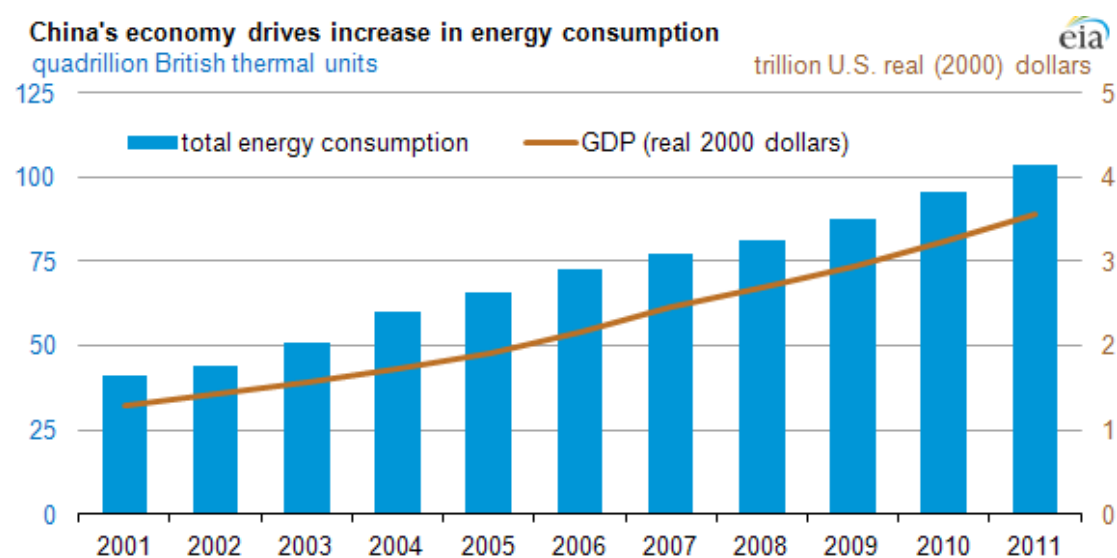
Yet, initially this vital signal was not readily received by various agencies in the governance structure. From 2006 to the first quarter of 2007, in the beginning of the 11th FYP, local governments and SOEs were extremely reluctant to move in the government-induced direction from the tried and tested economic development mode of growth-at-any-cost. The next section will examine an EE institution that the government commissioned to overcome such obstacles to implementation.

4.4 ECTRS: the nexus of EE institutional change

The growth-at-any-cost ideology was the primary motivation of local governments and individual enterprises. China’s economic governance structure served short-term GDP, rather than the long-term economic planning. To sustain such an economic structure, escalating energy and raw material supplies were necessary (Fig. 4.1). Although the new and ambitious ECER agenda in the 11th FYP was part of the central government’s long-term but urgent economic strategy, it conflicted with the short-

term economic growth agenda that had been firmly embraced by government agencies at all levels. Despite the strong emphasis on ECER and economic restructuring in the 11th FYP, the economy was obstinately path-dependent.

Figure 4.1 Economic growth and energy consumption of China (2001-2011)



Source: EIA website, <http://www.eia.gov/todayinenergy/detail.cfm?id=8070> [last assessed 18 June 2015]

Sensing the neglect of the ECER strategy across the country, and more importantly, worrying about the failure to advance the broader economic readjustment agenda, the Chinese government decided to strengthen the ECER work through a series of political interventions. Given the fact that the EE institutions are highly operationally dependent on the economic governance structure, in order to realize the government's twin goals of economic adjustment and ECER, interventions needed to be strong enough to break the existing institutional dynamic of EE developments. So the government introduced a strict target-based evaluation system.

4.4.1 Integrating EE into the cadre evaluation system

In March 2007, the ECER Comprehensive Plan stressed:

“[T]he ECER targets should be integrated into the economic and social **evaluation** system. The ECER criteria should be a veto criteria for the cadres and enterprise managers’ performance evaluation system.”⁷⁷ (要把节能减排指标完成情况纳入各地经济社会发展综合评价体系，作为政府领导干部综合考核评价和企业负责人业绩考核的重要内容，实行“一票否决”制。)

This institution is called the EC Target Responsibility System (ECTRS, *jienerg mubiao zerenzhi* 节能目标责任制). In China, a comprehensive and quantified cadre performance evaluation system was developed by the Commission for Discipline Inspection of the Central Committee of the CPC (CCDI) and Organization Department of the CPC Central Committee (OD). The list of criteria include: economic growth, social stability, social development, corruption, environmental protection and EC/EE, etc. The criteria were broadly classified as “hard targets” (*ying yueshu* 硬约束) and “soft targets” (*ruan yueshu* 软约束). A “hard target” is compulsory to meet, and has strictly quantified evaluation criteria, while a “soft target” does not have to be strictly implemented. Economic growth had been the single most important “hard target” since the 1980s. With the propaganda of the “harmonious society” under President Hu Jintao in 2000s, social stability (evaluated according to the number of local riots and protests) became equally important criteria during the 11th FYP. In the ECER Comprehensive Plan, accomplishing the ECER target became one of the “hard targets”, meaning that if the cadre did not meet the assigned target, he/she would not get promoted – there would be a “veto” in cadre’s performance evaluation.

⁷⁷ “Veto criteria” means if the target of this item is not achieved, no matter how well performed in other items, the promotion of the cadre will be vetoed.

4.4.2 Theories of ECTRS

International literature on China's ECTRS is limited. It can be grouped into three categories: institutional innovation theory (Qi, 2013), interest bundling theory (Kostka and Harrison, 2012, Kostka and Hobbs, 2013, Harrison and Kostka, 2013), and adaptive legitimacy theory (Wang, 2013).

Qi Ye and his team from Tsinghua University, in the first comprehensive attempt to theorize ECTRS in the Chinese academic world, made a huge impact on international scholarship. Qi (2013) argued that ECTRS was the fundamental regulatory institution in realizing the national strategy of EE in the 11th FYP and that this is still the case in the following 12th FYP. Further, he considered ECTRS as the key institutional innovation in achieving the ambitious 20% energy intensity reduction goal, because -

1. the establishment of EETRS marks the transition of the EE management system from the central-government-industrial-agency-dominated model to the local government dominated model, in terms of all of the fiscal, accounting and other forms of regulatory tools.
2. ECTRS has been effectively implemented at all four levels of government, including provincial, municipal, county, and township governments, as well as a broad range of energy intensive enterprises (both public and private).

Qi insightfully identified ECTRS as the crucial institution in pushing the whole country towards achieving a serious EE target. Before and after ECTRS was strictly implemented, the results of target accomplishment varied drastically. According to official data, China accomplished a 19.1% energy intensity reduction in the 11th FYP

in the end, which was contrary to the phenomenon of the first 5 quarters. Yet, this target-driven institution was hardly an institutional innovation.

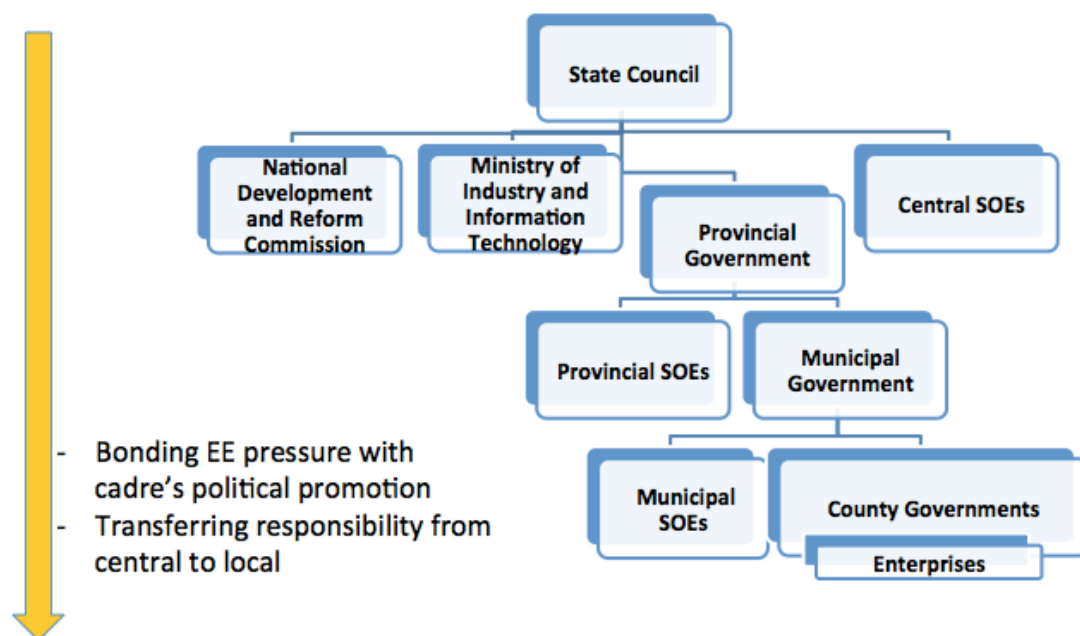
Wang (2013) argued that ECTRS was an adaptive process, which moved towards legitimizing the government. As a government that was not democratically elected, the Chinese Communist Party had been using economic growth as its source of legitimacy. In the 11th FYP, with the increasingly salient environmental degradation and social dissatisfaction accompanying growth, the government had to provide environmental protection and social stability along with economic growth as its legitimate foundations. Wang said that this adaptive process mainly used the discipline of cadre evaluation and energy quota systems that was already widely deployed in the 1980s. The ECTRS in essence is an adoption of the traditional top-down signaling mechanism in the area of environmental protection, which was driven by the CCP government's search for legitimacy in the absence of democracy. Therefore, ECTRS is a reutilization and combination of the existing regulatory and institutional resources, rather than a complete institutional innovation.

Kostka, Harrison and Hobbs also noticed the top-down signaling mechanism in China's EE institutions. They argued that the "bundling" of EE targets with economic interests was the fundamental strategy used by local officials in realizing ECER targets. Yet, as argued in the second section of this chapter, China's ECER strategy was driven by a combination of the search for international image as well as domestic needs – a legitimation crisis, as Wang (2013) well said, an urgent economic adjustment, as well as a regulatory disaster. Also, the "interest bundling" strategy used by the local officials (Kostka and Hobbs, 2013) was originally designed by

China's central planning systems.

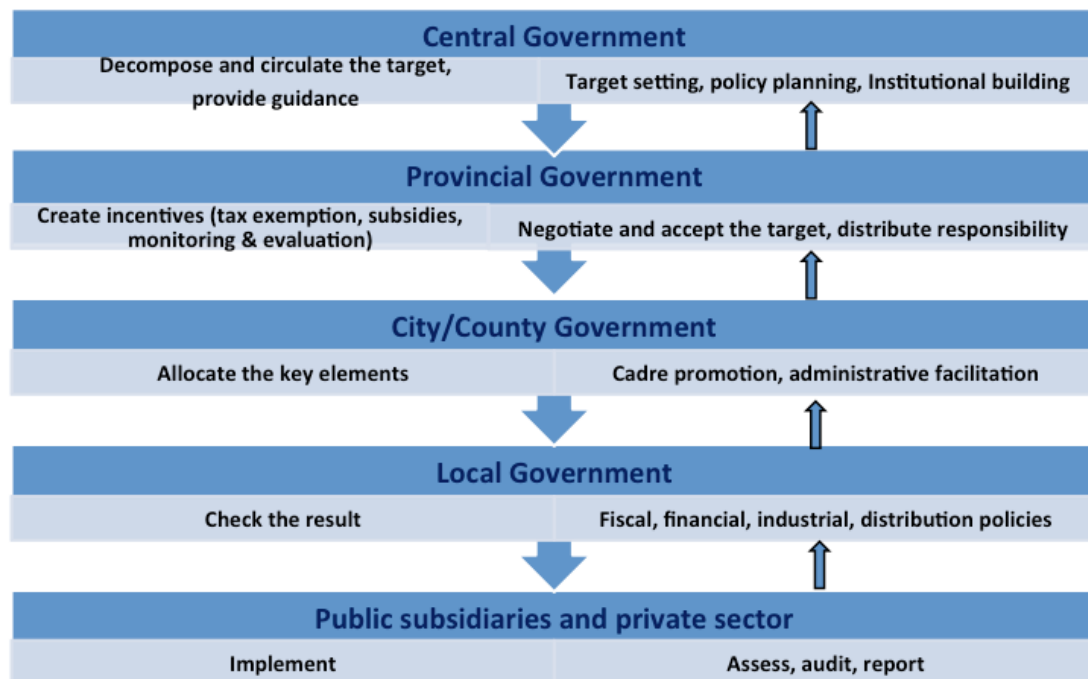
Though hardly an innovation, ECTRS was indeed the hub of China's EE institutional change since the 11th FYP. So I use the organization-governance-institution framework to investigate the ECTRS and the real change that this institution brought about.

Figure 4.2 The top-down political pressure transfer through ECTRS



Source: converted from Qi (2013, p.88).

Figure 4.3 Mechanism of ECTRS



Source: Ibid.

4.4.3 Nominal EE organizational change within the economic governance

In June 2007, the State Council established a leadership group (*lingdao xiaozu* 领导小组) on Climate Change and ECER, with Premier Wen Jiabao serving as the nominal head. Its members included ministerial heads of NDRC, Foreign Affairs, Science and Technology, Inspection, Defense Technology and Engineering, Finance, Land and Natural Resources, Construction, Transportation, Environmental Protection, Agriculture, Public Health, Tax, Statistics, Electricity Regulation, etc. Its executive office was set under NDRC to “organize and implement State Council policy principles of ECER, integrate and implement ECER work, research and audit major policy recommendations, coordinate major problems of implementation” (组织贯彻落实国务院有关节能减排工作的方针政策，统一部署节能减排工作，研究审议重大政策建议，协调解决工作中的重大问题).

Within a few months, provincial governments set up ECER working groups, followed by the municipal and county governments, and finally the individual SOEs, Dan Weis, villages and private enterprises.

There were basically three levels of the ECER organizational structure:

At the Central Level

- State Council's Leading Group on Climate Change and ECER: strategy and coordination;
- National Development and Reform Commission (NDRC): set targets and formulate regulations;
- Various Ministries (Finance, Energy, Human Recourse, Industry and Information Technology, etc): coordinate with NDRC with specific policies;
- State-owned enterprises: meet the target, and set example to the industry.

At the Subnational Level

- Provincial Climate Change and ECER Leading Group - overall lead, coordinate and supervise climate change & ECER work at the local level
- Head by the Governor/Mayor, office set in the province/city Development and Reform Commission (*Fa Gai Wei*) and directed by the head of *Fa Gai Wei* , members included heads of the local economic, fiscal, tax, land, environment, construction, transport, technology commissions.

At the Micro Level

- Each energy consuming entity, in both public and private, set up an internal office oversees the EE implementation – target driven;
- Example: office of EE in governments, schools, hospitals, companies, villages, and even kindergartens – till 2010, 4,850 governments buildings have completed energy audit, and 6,000 public buildings have published their energy consumption data; 72 schools launched EE pilot projects.

However, if we compare this organizational structure to the previous national EE organizational structure, the changes were more nominal than structural. The titles of the central, sub-national and micro level offices were changed from EC/EE to “Climate Change and ECER”. Fieldwork interviews with local officials, SOE and private enterprises managers expressed the same conclusions: after the order from the

State Council on strengthening ECER work, setting an ECER responsible agency within each organization became a compulsory request from the upper level government/organization. To fulfill such a supervised request (*yingfu jiancha*应付检查), all of them renamed the already existing office of EC/EE as the office of “Climate Change and ECER”, while the personal and material resources for the office remained unchanged.

Similarly, into the 12th FYP, when “Low Carbon Development” replaced ECER to become the propaganda word of EC/EE policies, the name of the “Climate Change and ECER” offices at subnational level changed into “Low Carbon Pilot” Lead Group/Offices once again. Qi (2013, p.332-341) summarized three kinds of origins of the sub national Low Carbon Pilot Lead Groups:

1. Directly Led by the Climate Change and ECER Lead Group without establishing a new office (Guangdong/Hube/Chongqing/Shenzhen): headed by the Governor of the Province, with an office set within the Provincial Development and Reform Commission (*Fa Gai Wei*);
2. Restructured from the previous Climate Change and ECER Lead Group: (Nanchang/Liaoning/Shanxi/Tianjing/Baoding): same above;
3. A New Low Carbon Pilot Lead Group, with an office set up within the existing Climate Change and ECER Lead Group under the subnational Economic Commission of *Fa Gai Wei* (Yunnan/Guiyang/Hangzhou/Xiamen).

4.4.4 Weak Auditing System and immense Data Fraud

A more meaningful organizational change than the nominal change of the Lead Group/Offices was the establishment of a national energy and environmental auditing system. Shortly after the ECER Comprehensive Plan in 2006, the State Council issued a package of energy intensity data collection, audit and inspection policies.⁷⁸

⁷⁸ Guofa [2007] No. 36 referred the three policies jointly made by NDRC, National Bureau of Statistics and National Bureau of Environmental Protection – ‘Implementation plan of the auditing system for energy consumption per capita of GDP 单位 GDP 能耗统计指标体系实

Following the top-level policies, all provinces set up energy intensity statistical systems. However, the data auditing organizations were under the leadership of, and reported to, the same economic governance. With inbuilt conflicts of interest, independence could not be guaranteed. In a field interview in June 2013, an anonymous middle level official who works for the energy intensity and environmental data auditing system in Yuxi city, Yunnan province said:⁷⁹

“Energy and environmental data has to be produced according to the guidance from the upper level officials. The data auditing bureau is under the leadership of the municipal party and government. If we do not obey the order from the government, we will lose our job (*diu fanwan* 丢饭碗). Data is not difficult to produce, and you do not necessarily need to lie. For example, if the government wanted one factory to have permission to operate, we will audit its environmental data shortly after a rainfall in the early morning, when the pollution data would appear nicer. Before we went to audit the energy data, we would inform the factory beforehand, say a week in advance. So when we arrive, the data always appears to be perfect. After the regular check, the operation is almost free from being inspected.”

Without organizational independence, massive data falsification was unavoidable in ECER work (Andrew-Pearce, 2006, Wang, 2013, Qi, 2013, Ghanem and Zhang, 2014), which utterly paralyzed the effectiveness of the whole target-driven ECER system.

Fan (2014) summarized such a target management system as: *self-set, self-distribute, self-coordinate, self-audit, and self-evaluate*⁸⁰ - the government set the target (20%) as a strong policy signal; then decomposed the target to subnational and local

施方案’ ‘Implementation plan of the rating system for energy consumption per capita of GDP 单位 GDP 能耗统计指标体系实施方案’ and ‘Implementation plan of the evaluating system for energy consumption per capita of GDP 单位 GDP 能耗监测体系实施方案’ – as “The Three Plan 三个方案”.

⁷⁹Location: Hongta district, Yuxi city, Yunnan province.

⁸⁰“自己制定指标，自己分解，自己下达，然后自己再检测，评估” as in the original Chinese text.

governments; the government established the coordination office, and became the body in charge of evaluation and audit as well. Such an organizational conflict of interest did not touch the essential characteristics of EE governance - EE's complete dependence on the economic governance structure in order to function. So it could not break the persistent "institutional equilibrium" driven by economic growth that was a major obstacle to successful EE policies. Despite the strengthened energy and environmental auditing systems at both national and subnational levels, the unchanged governance structure could not prevent constant conflicts of interest between EE and short term economic growth goals. Residing within the economic governance, EE organizations had no choice but accommodate such a conflict.

4.5 Institutionalizing the short-term-profit-driven implementation logic

After the phases of contextualizing the triggering events, conceptualizing the politics of the EE policy field, analyzing the organizational arrangements within the economic governance structure and the radical EE policy schemes, we reach the last stage of analysis of the institutional change process for the second critical juncture – the institutionalization of the EE practices emerging from the previous stages.

The sudden outbreak of the international financial crisis and the enormous stimulus package of the Chinese government that followed added an important and somewhat unexpected angle to the political and economic landscape of EE after 2008. This section examines how this second triggering event escalated the process of EE institutional change in a "short-term, profit-driven" direction. The first half of this section addresses the informal politics and economies for EE subsidies, while the second half investigates the selective implementation logic of local governments.

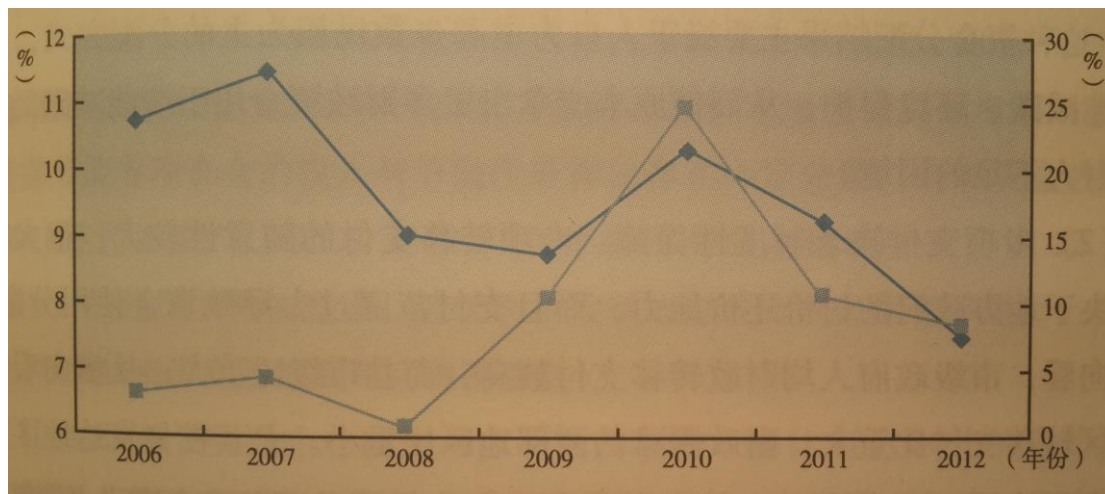
4.5.1 Financial Crisis, the 4 trillion stimulus package and manoeuvring for EE subsidies

In 2008, the international financial crisis hit the export-oriented Chinese economy badly. The economic crisis overwhelmed and rendered irrelevant the original economic adjustment strategy during the 11th FYP. To save the economic growth and to prevent mass unemployment, the government launched an unprecedented 4 trillion RMB's ⁸¹ stimulus package. Most of the stimulus package was invested in infrastructure and real estate related industries, which are energy and carbon intensive (Li, 2015).

Ironically, during this period, although the economic adjustment agenda – the initial goal behind the ECER strategy during the 11th FYP – was superseded, both the government's rhetoric and its investment in ECER dramatically increased. In the 4 trillion stimulus package, around 210 billion was assigned to ECER and ecological projects, accounting for 5% of the whole package. Fig. 4.4 shows that since 2008, the starting year of the economic stimulus, the public funds for EC/EE grew annually at more than 10%. Public funds attracted huge private capital into the field as an effect of synergy. China soon became a world leading investor in EE.

⁸¹ Equivalent to 586 billion USD.

Figure 4.4 GDP and EE public investment in China (2006-2012)



Note: Dark blue - GDP (left axis), Light blue - EE public investment growth rate (right axis)

Source: table 2-12, Qi (2013, p.65)

The stimulus package became a second layer in the crisis-driven triggering mechanism during the second critical juncture. In 2008, the nominal organizational change of the ECER work almost finished, while the major driver for the ECER agenda – economic adjustment – lost prominence, the enormous public fund too over as most important driver of EE development. Various players, from SOEs, to local officials, to enterprise managers came up with all kinds of methods to share a slice of the growing cake of public funds for EE.

In June 2013, an anonymous official in Department of Housing and Construction in Yuxi City of Yunnan Province described the application process for public funding for an EE pilot village program:⁸²

“There is a provincial fund for ECER pilot projects. There are so many cities/areas in the province; we have to make a best project proposal in order to get the fund. So first of all, we need to select a village that has better foundations for ECER showcase work – better housing quality, better environment, better transportation, and most importantly, a village

⁸²Location: Department of Housing and Construction, Yuxi City, Yunnan Province

party secretary who is cooperative. After the pilot project is accomplished, the provincial leaders and inspectors will come down to check the work. So selecting a perfect showcase village is the first step. Then we need to take care of all the public relations work with officials in all related areas. It is a test for us. I have to invite officials, experts (who sit in the selection committee), bank managers (of the publicly owned banks which are responsible for leasing the grant/loan for the project) for sightseeing and fancy dinners before and after submitting the application; and to communicate with all relevant people all the time...Getting the funding is a big accomplishment, which will contribute to the official's political promotion. The actual technology and construction are minor issues compared to getting funding and fulfilling the inspection afterwards. Then again, we have to keep a good relationship (*gaohao guanxi* 搞好关系) with the relevant upper level officials (*shangji lingdao* 上级领导)."

Though the ECER funding was not as lucrative as that of other infrastructure projects, the political motivation was strong enough for local officials to play such a game – where the rules of the game encouraged the agencies/players to select the best village for demonstrations, rather than the village that was most in need, or the one that would have the most potential to attract emulation once the pilot program was complete. This was followed by an expensive process of application for funding – excessive expenditures and other forms of resources including time and manpower occurred for public relations.

With government support, an EE market was fast developing. During fieldwork, I observed a conversation between Dr. Yi, a former civil servant and a current entrepreneur in emerging energy service companies (ESCOs) – helping companies to save energy with EE technologies and management, and one of his potential business partners in Chongqing city. This business partner is one of the business tycoons in the local entertainment industry. Dr. Yi approached him for collaboration in planning his new entertainment center. Dr. Yi proposed that his ESCO could enable the entertainment center to be more energy-efficient and greener. The business tycoon

replied:

“Dr. Yi, I am not interested in building anything. It is too tiresome (*tai mafan*, 太麻烦). I am only interested in getting the land at a subsidized price. That’s why I am here to talk to you. We all know the policy - if the land is for green or energy efficient purposes, the government will give subsidy, and it is easier to get the land. I need you to help me make the proposal look green. I will look after the rest. After we got the land, we don’t need to do anything. Wait for a while, and sell it to someone else at market prices. That’s how we gain our profit. I will share the profit with you at an agreed rate. We don’t need to have the patience and capacity to build any actual project. The government won’t check after the initial examination and approval (*xiangmu shenpi* 项目审批). Once we get the land, no one will check. This is the way of business nowadays everywhere.”

Though Dr. Yi refused such an idea by the end of the negotiation, he honestly told me, according to his practical experience in the field, what the business tycoon said about getting the ECER public fund for land and constructions under the economic stimulus package was not unusual. Fan (2014) argued that “stressing approval but neglecting inspection” (*zhong shenpi, qing jianguan* 重审批 轻监管) is a massive EE regulatory problem in mainland China - the project examination and approval process for ECER was very strict, but once the project is approved, there is almost no follow-up inspection. In order to pass the approval procedure, projects commission professional ESCOs or expert teams from research institutes to prove proposals of high EE standards with expert evaluation reports. Interviewees working for public-owned architecture and planning institutes in Sichuan province and Beijing experienced similar situations despite locational differences: pressures from the employer would influence the professional judgment of a project’s EE standards as well.⁸³

⁸³ Anonymous engineers works in China Southwest Architectural Design and Research Institute Corporation LTD (CSWADI) (interviewed in Chengdu, July 2013) and Beijing Institute of Architectural Design (BIAD) (interviewed in Beijing, September 2013). Both of CSWADI and BIAD are SOEs owned by the subnational governments.

Even when excessive ECER related public investment became increasingly available in the wake of the stimulus package, an independent and effective regulatory system remained persistently lacking. EE institutions experienced a government-dominated commercialization that primarily aimed for short-term profit. The EE process became increasingly oriented towards funding-and-profit-seeking than to operational EE results. This alienation from the original purpose, hand-in-hand with the ineffective organizational change, further reinforced the EE institutions that served short-term economic growth rather than long-term sustainability.

4.5.2 A selective implementation tactic

The “interest bundling” theory (Kostka and Hobbs, 2013) argued that by bundling EE with economic development, as in economic structural adjustment, shutting down the outdated production capacity and reducing overcapacity, local governments strategically promoted the EE agenda. However, this theory cannot explain why some of the EE policies were better accomplished than others. For example, the removing of outdated production capacity was one of the best accomplished ECER policies during the 11th FYP. All of the electricity, iron and steel, coal, cement, panel glass, and paper industries significantly outperformed the assigned targets (Table 4.4). But the areas controlling energy consumption and carbon emissions of buildings and transport barely met or even underperformed the targets.

Table 4.4. Target and achieved of removing outdated capacity policy in the 11th FYP (2006-2010)

Industry	Unit	Target	Achieved	Outperform
Electricity	MV	5,000	7,682.5	53.6%
Iron	10k tonnes	10,000	11,172	11.7%
Steel	10k tonnes	5,500	6,683	21.5%
Electrolytic Alum	10k tonnes	65	80	23.1%
Iron alloy	10k tonnes	400	663	65.8%
Calcium carbide	10k tonnes	200	360	80%

Coke coal	10k tonnes	8,000	10,538	31.7%
Cement	10k tonnes	25,000	33,000	32%
Panel glass	10k tonnes	3,000	3,800	26.7%
Paper	10k tonnes	650	1,030	58.5%

Source: calculated based on data from table 1-4, Qi (2011, p21)

Andrew-Speed (2012) explained the disparity in the EE targets and performance from the political institutional perspective: China's political institutions are good at motivating centralized and public-owned sectors, while they are ill-equipped to mobilize EE resources and intention from the fragmented private sectors. I would push this explanation further to argue that the disparity in implementation is not only a reflection of domestic political institutions, but also a selective choice made constantly by the agencies in ECER implementation work. EE institutions resulting from the second critical juncture shaped the behaviour of local officials and energy consuming bodies. Playing by these hidden rules, various agencies selected the policies that could bring economic and political returns, and ignored the ones that conflicted with them.

A deputy mayor of one city in Guangxi province said in telephone interview on condition of anonymity in February 2014:

“No one has been punished for not accomplishing the ECER work, but people will not get promoted for not securing economic growth. So in practice, officials seldom care about ECER target. But, when some of the ECER policies can help us to achieve some economic and even political goals, we would definitely use the ECER policies. For example, when we wanted to promote a SOE in an energy intensive industry and remove its competitors, we would use the ‘Promote Big and Shutdown Small’ policy that legitimated shutting down its competitors who did not meet the scale standard. But the SOE we wanted to promote was not big enough neither. What to do? The government would ask the bank to lend money to the SOE and help it update its equipment. Its competitors could not get loans. By doing so, we realized our economic goals and ECER target at the same time – a win-win situation.”

In fact, the “interest bundling” between EE and the economy deployed EE as a legitimate policy tool to smooth the process of realizing economic goals, rather than bundling EE with economic development in the purpose of realizing EE. The various ECER subsidy programs provided the resources for various selective manipulations of responsible bodies – ranging from local authorities to business practitioners. ECTRS and a paralyzed auditing system further allowed the institutionalization of practices of manipulation.

The energy consuming companies also actively shaped this institution by acknowledging and following those informal rules. A CEO of the major private steel production company in Yuxi city of Yunnan province said in fieldwork interview in June 2013:⁸⁴

“The SOEs can use the most energy efficient equipment, because they can assess the capital. Their job is to set an example for the industry without caring about the cost. We want to become energy efficient as well, but the standards sometimes are too strict. I have adopted all the EE technologies that are cost-effective. I am a businessman. I do not care about showing off to some upper level officials. I only care about my profit. For those that are not economical but still required by the government, I have to think of other methods, such as inviting the inspectors for dinner so that they could inform me before checking. My technicians could always do some tricks to cooperate with them. Believe me, the government does not care about ECER, as long as you pay the taxes and treat them well. But if you don’t make them comfortable in anything, anytime, ECER can always be an excuse for the government to give you trouble. So, sometimes, I have to do some uneconomic EE things, which definitely increase my cost. Then my customers have to pay a raised price. We are anyway more efficient in production and management than the SOEs, because we have to look after ourselves. Our price is always better than them. Some rise in price would not destroy us so far. But if the government was not happy with you, it can be devastating.”

Such a selective and manipulated implementation tactic of ECTRS and ECER strategy, reinforced by the economic growth oriented stimulus package led to steep

⁸⁴ Location: the interviewee’s factory, Yuxi City, Yunnan Province.

increases in energy consumption and carbon emissions during that period. Towards the end of the 11th FYP, fearing their jurisdictions would miss the EE target, local officials started using unusual ways to make the statistics look palatable. The energy intensity is calculated based on electricity consumption data rather than primary energy data. In order to reduce electricity consumption, local authorities implemented the *La Zha Xian Dian* policy again – shutting down the power supply to small and medium sized enterprises. In order to keep the businesses running, business owners in those areas had to generate power from petroleum by themselves. This reaction caused serious local petroleum shortages (*youhuang* 油荒).⁸⁵ Mr. Ma Liming, an energy reporter from CCTV reported this phenomenon by the end of 2009. The report gained attention from the then Premier Wen Jiabao. Premier Wen criticized such behavior and asked local officials to stop doing that, while strengthening the importance of accomplishing the ECER targets at the same time.⁸⁶ In 2010, massive media reportage covered the shutting down of electricity supply to private business and even hospitals, schools, traffic lights and residential areas.⁸⁷ This last-minute target accomplishment, though being criticized by both the top leadership and the public, spread throughout China (Wang, 2013).

⁸⁵ Many mainstream media have criticized such negative effects of *La Zha Xian Dian*, See for examples: “La Zha Xian Dian: Who manipulated the good policy of ECRE ‘拉闸限电’狂冲刺，节能减排‘好经’给谁念歪了？” at people.com (the website of *People’s Daily*) <http://opinion.people.com.cn/GB/157411/202005/203718/> [last assessed 18 June 2015]; and “La Zha Xian Dian is a lose-lose situation 拉闸限电是赔了夫人又折兵” at 163.com (one of the major news websites in mainland China) <http://money.163.com/special/peilefurenyouzb/> [last assessed 18 June 2015].

⁸⁶ Interview with Mr. Ma Liming in August 2013 in Beijing International Conference Center during a national conference.

⁸⁷ For example, Xinhua News Agency, China’s national news agency reported the *La Zha Xian Dian* situation in Hebei province in September 2010: http://news.xinhuanet.com/photo/2010-09/07/c_12524330.htm [last assessed 18 June 2015].

4.6 Conclusion

This chapter uses the five-phase analytical framework to address the institutional change process of China's EE development during the second critical juncture through.

First, responding to the escalating ICCN pressure and the need for domestic economic adjustment, the Chinese government set an ambitious energy intensity reduction target for the 11th FYP. Second, a comprehensive ECER strategy was launched by the government as an umbrella policy scheme to solve economic as well as EE problems. Because of the path-dependence of short-term economic growth priorities while reducing the importance of other developmental goals, the implementation of ECER strategy faced massive resistance from local governments and individual enterprises.

In order to strengthen the implementation of the ECER strategy, the government launched ECTRS as a complete policy package to motivate local officials in meeting the EE targets. However, the organizational changes (the third phase) required by ECTRS was nominal. EE agencies still relied fully on the economic governance structure in order to operate. Yet the auditing and inspection system was under the direct leadership of economic and political leaders. Such an organizational arrangement could not prevent the political leaders' constant interventions for the purpose of securing short-term economic goals and manoeuvring EE objectives.

In the middle of the 11th FYP, the Chinese government launched a 4 trillion economic stimulus package in response to the international financial crisis. The economic adjustment strategy, which was the backbone of the ECER was sidelined by the

agenda to keep economic growth on track. But ECER, as the flagship policy EE scheme of China, was still positioned as an investment opportunity according to the original plan. Meanwhile, public funds became increasingly available for ECER projects as part of the stimulus package. The existing EE regime, altogether with various agencies in the government and the market, directed ECER into a profit driven and selective implementation trajectory, through various manipulations of the original and formal rules. Such manipulated behaviour formed the “hidden rules” in EE development, and fundamentally structured the EE institutions.

China’s EE institutional change in the second critical juncture was an adaptation to its existing political system – using a top-down political promotion institution to motivate cadres to implement EE targets. However, such an adaptive process was not able to break the ‘institutional equilibrium’ of the growth-at-any-cost trajectory that emerged from the first critical juncture of EE development. Moreover, the basic organizational structure remained relatively untouched, which reinforced the power of economic governance over EE development, and EE’s high dependence on economic governance. In return this relation of dependence emulated the obstacles ingrained more generally in Chinese political and economic institutions, leading to massive data falsification, regulatory manipulation and collusion over public funding in the area of ECER and broader low carbon development.

Chapter 6 and 7 will use a case study to elaborate the policy process in detail within this process of institution building. But before going to the case study, in the next chapter we will turn comparatively to India in its second critical juncture.

CHAPTER 5: INDIA'S SECOND CRITICAL JUNCTURE

This chapter addresses India's institutional change process in the second critical juncture. The chapter is organized following the five steps of my analytical framework: First, I discuss how a crucial time difference and a set of political and economic reasons made the combined influences of ICCN and the international financial crisis on India's second critical juncture of EE development different from China's; Second, I examine the conceptualization process of EE in this context; Third, I map out the EE organizational development in the highly constrained energy governance complex; Fourth, I analyze the development of policy; Fifth, I explore the institutions that emerged from the previous stages. Finally, I conclude the chapter with a summary of the main arguments.

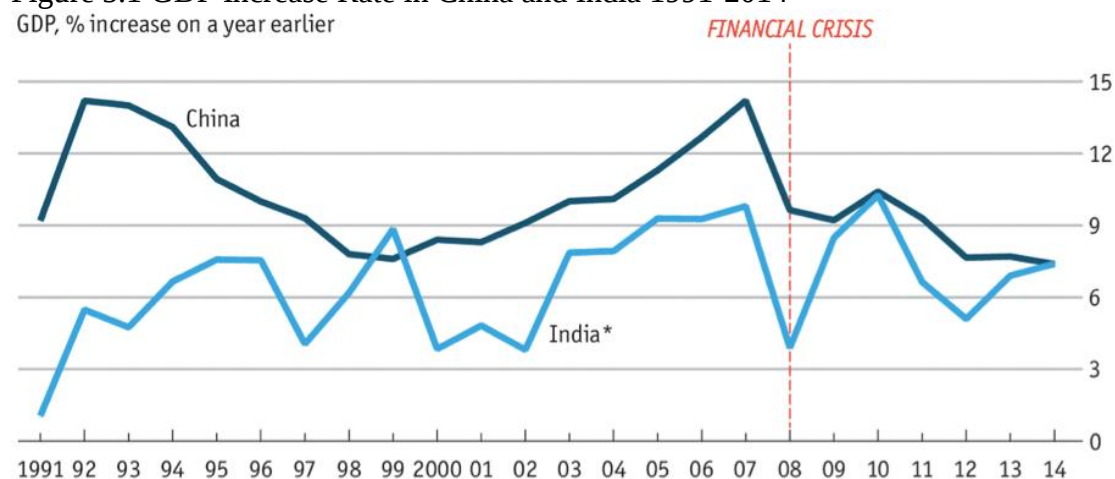
5.1 A joint triggering effect: ICCN + international financial crisis

As in China, India's second critical juncture of EE institutionalization was triggered by ICCN as well. Yet, the real impact of ICCN on India's domestic LCD policies was not to be felt before the elapse of an extra one to two years compared with China. This crucial time difference has made the actual triggering effects of India's second critical juncture different from China's. Thanks to this one to two years' delay, India's domestic response to ICCN coincided with the international financial crisis, which in turn substantially affected India's determination and capacity for state investment in LCD and EE/EC (Fig. 5.1).

In this section I elaborate this argument in two stages: first, I explain why and how the transfer of ICCN pressure was delayed in the Indian case as compared to China;

second, I discuss the combined effects of ICCN and the international financial crisis on the formation of India's second critical juncture for EE development.

Figure 5.1 GDP Increase Rate in China and India 1991-2014



Note: *Fiscal years ending March, 2011-12 base year from 2012 onwards; data from IMF; chart from the Economist.com: <http://www.economist.com/news/business-and-finance/21642656-indias-economy-grew-faster-chinas-end-2014-catching-dragon> [last assessed December 29 2015].

5.1.1 ICCN pressure delayed

Like China, the ICCN played an important role in pushing forward a domestic policy change addressing climate change and EE in India. However, compared to China's radical policy shift facing ICCN pressures for domestic mitigation, India took a consistent and instrumental approach that effectively disconnected the international climate change pressures from the domestic political stresses during the period of twenty years before 2007. According to Dubash (2013), India strategically shaped the "climate equity frame" – perceiving ICCN as a North-South contest around the rights and burdens of LCD. India's active and experienced civil society groups (i.e. Centre for Science and Environment [CSE]),⁸⁸ internationally experienced and charismatic

⁸⁸Anil Agarwal and Sunita Narain, the founders of CSE played a significant role in shaping India's position in the "climate equity frame" (Dubash, 2013). In the famous "Global Warming in an Unequal World" (1991), Agarwal argued: "The idea that India and China

diplomats and officials (like Jairam Ramesh, former Minister of Environment and Forests), and substantially lower overall and per capita energy consumption and GHG emission as compared to China together contributed to lowering the pressure on India's domestic politics from the ICCN. All of the aforementioned elements contributed to a delay in awakening the Indian domestic climate and low carbon policy change compared to China.

Nevertheless, since 2007, a gradual climate policy and governance change could be seen inside India. In June 2007, around the same time China set up the Prime Minister's Leading Group on Climate Change and Energy Conservation (PMLGCCEC), India also set up a Prime Minister's Council on Climate Change (PMCCC). Like China, India's top-level inter-ministerial coordination body was established in response to the increasing ICCN pressure.⁸⁹ Dr Prodipto Ghosh, former Secretary of MoEF and a non-government member of PMCCC said in my fieldwork interview in February 2014:⁹⁰

“There were basically two purposes of setting up the PMCCC. The most important thing was to deal with the ICCN. Previously, the Foreign Affairs Ministry and MoEF were responsible for representing India in ICCN. But the pressure became more intense, so multi-ministerial and non-government leaders had to be involved. The PMCCC could serve as a coordinating body. Second, the PMCCC was set up to prepare India's

must share the blame for heating up the earth and destabilizing its climate... is an excellent example of environmental colonialism.” (as cited in Dubash, 2013).

⁸⁹ Responding to a similar external pressure, India's PMCCC had parallel responsibilities as China's PMLGCCEC. As the official descriptions laid out:

- China's PMLGCCEC: key national climate change strategies making, planning and policies; coordinating important issues related to climate change and energy conservation; researching on international climate negotiations.

- India's PMCCC's responsibilities contain three major areas: core multi-ministry negotiating team for ICCN, coordination team of the implementation of National Action Plan on Climate Change (NAPCC), and setting research agenda.

⁹⁰Location: the interviewee's office, TERI, New Delhi

National Action Plan on Climate Change (NAPCC), which was also required by ICCN.”

Later, in June 2008, a year after China published its National Climate Change Plan in 2007, India also announced its National Action Plan on Climate Change (NAPCC). The National Mission on Enhancing Energy Efficiency (NMEEE) was revealed as one of the 8 subject National Missions at the same time.

5.1.2 2006-2008: A crucial time difference

Although the gap between China and India’s national action plan on climate change was only a year, it made a vital difference to the contextualizing process of the triggering events for India’s second critical juncture, as compared with China.

China initiated a radical response to ICCN as early as late 2005-early 2006 by setting up an ambitious EC/EE target (20% reduction of energy intensity during the 11th FYP) and a comprehensive ECER policy scheme (see Chapter 4). China’s national climate plan (2007) was built upon its existing ECER regime. China’s PMLGCCEC was developed from the previous Prime Minister’s Leading Group on ECER. On the other hand, India’s NAPCC did not have similar domestic EE/EC and climate regimes of comparable scales and capacities like China. India’s NAPCC had to mobilize political, economic and social support from a much weaker background than China.

More importantly, China started the ECER and the domestic climate strategy more than two years prior to the international financial crisis in late 2007 to 2008, while India’s starting point for the NAPCC just coincided with the beginning of the financial crisis in Asian markets in mid- to late- 2008.

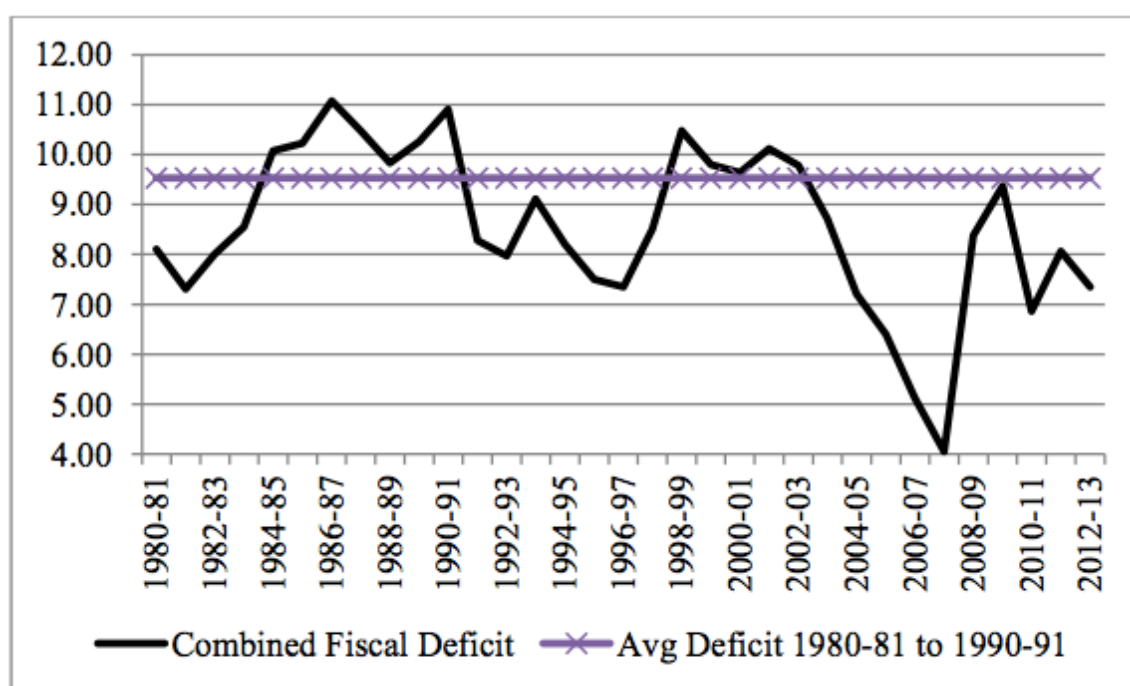
I argued in Chapter 4 that China started its second critical juncture in response to the ICCN. The starting points of this juncture were signaled by the government's strategically synthesizing the external pressures on climate change and the domestic need for economic adjustment and political/regulatory consolidation into the ECER strategy for the 11th FYP in 2005/6. Two years later, the effect of global recession and the economic stimulus package China established in consequence derailed its original ECER scheme, which directed the EE institutionalization process into a short-term-profit-driven approach. In this way, the ICCN and the international financial crisis formed a two-step-triggering-effect to this conjuncture of EE institutionalization process in China.

While in India, the ICCN and the international financial crisis combined to affect the second critical juncture for EE development starting in 2007/8 and lasting till the present day (Fig. 5.1). By the time the Indian Government announced the NAPCC in June 2008, the effect of the global recession in India was already evident. Policy insiders interviewed during fieldwork⁹¹ exposed the fact that the NAPCC had been produced without noticing the financial crisis, because there was a time gap between the policy-making process and the actual announcement. However, the massive impact of the financial crisis on the real domestic economy (particularly on demand for labor-intensive exports) within a few months after the policy announcement imposed immense obstacles in the way of the implementation of NAPCC over the following years. The slower growth of the economy, FDI and government revenues, and the suddenly increased deficit (Fig. 5.2 & 5.3), constrained political and financial support for EE and broader LCD agendas even further. Public expenditure stagnated

⁹¹January-April 2014, New Delhi.

between 2008-2010. The already institutionalized “no government subsidy” and “market based approach” towards EE was therefore reinforced by the domestic consequences of the global recession.

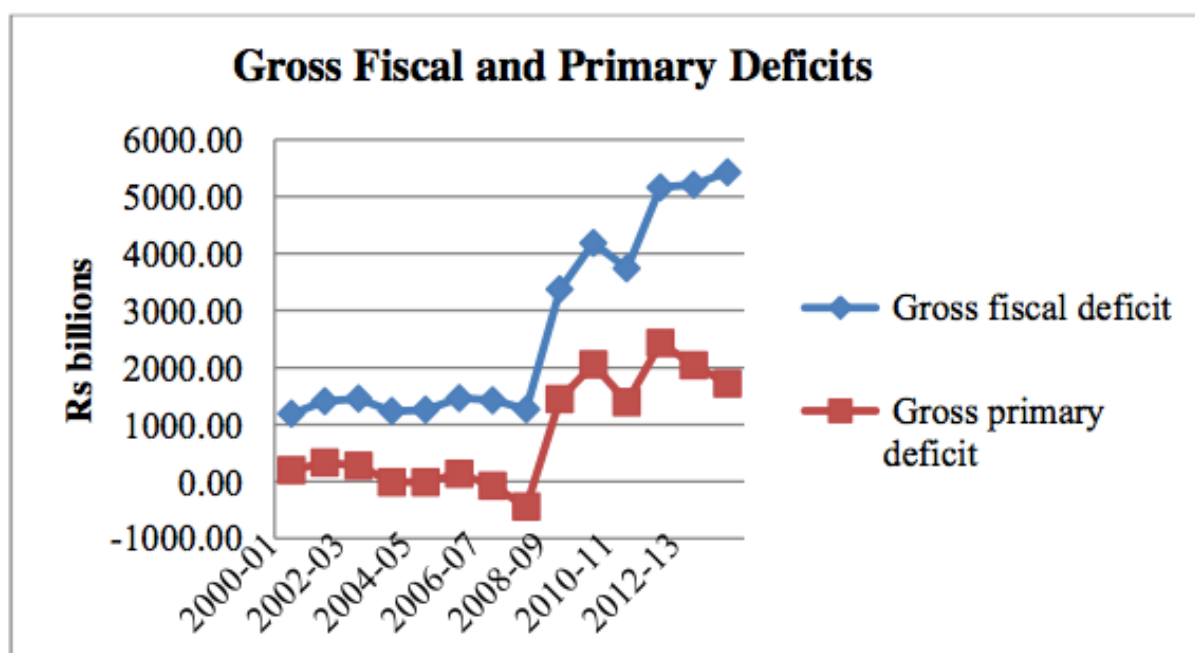
Figure 5.2 India’s Share of Combined (Centre and State) Fiscal Deficit in GDP (1980-2012)



Source: Reserve Bank of India, HandBook of Indian Economy

Note: Chart 2 in Sen and DasGupta (2014, p. 9).

Figure 5.3 India's fiscal and primary deficits (2000-2012)⁹²



Source: RBI, *HandBook of Statistics for the Indian Economy*

Note: Chart 6 in Ibid (p. 11).

5.2 Conceptualizing EE in highly constrained political and financial conditions

As argued in Chapter 3, to drive changes in EE governance structure, organizational arrangements, policy processes and institutional development, external crises need to be internalized in domestic political and economic contexts. Through the processes of internalization and contextualization, the domestic political economy shaped the institutional environments of EE. During the first critical juncture, the first agenda of India's energy governance – energy security - combined with the overall development rhetoric – poverty alleviation - structured the formation of a market-oriented and non-interventionist paradigm for EE institutions. These two agendas, though facing

⁹² Primary deficit is one of the compartments of fiscal deficit. While fiscal deficit is the difference between total revenue and expenditure, primary deficit can be arrived by deducting interest payment from fiscal deficit. Interest payment is the payment that a government makes on its borrowings to the creditors. See RBI, *Handbook of Statistics for the Indian Economy*, available at <https://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20Economy> [last assessed 21 December 2015].

different international and domestic pressures during this period, continued to play central roles in translating the external crisis into the domestic context of organizational-and-institution-building for EE.

5.2.1 Persistent Energy Insecurity

Billet (2010) found that the English-language press in India, which target the upper sections of society and reflect the elite perception took a “nationalistic narrative” towards climate change. Apart from the limited discussions about the rhetoric of “hiding behind the poor”⁹³, and about technological climate change debates, national energy security was the single most important source of India’s domestic policy change towards climate change and LCD (Dubash, 2013). Into the 21st century, at least four forces pushed “energy security” higher on the political agenda once again:

- 1. India’s increased growth rate and the rising energy consumption:** The 9th FYP (1997-2002) had an economic growth rate of 5.35% (Planning Commission, 1997). By the end of the 10th FYP (2002-2007), the annual growth rate had reached more than 9%. Meanwhile, the energy consumption was growing at a similar rate. The primary energy consumption of India more than doubled between 1990 and 2011 (Fig. 5.4).
- 2. Increasing dependency on the global energy market, and rising global energy prices (coal, gas and oil):** From 1990 to 2009, India’s total energy imports increased from 34 Mtoe to 236 Mtoe, with an import dependence

⁹³ The “hiding behind the poor” discussion was started by a Greenpeace-India report, which examined the disparities in emission levels across economic classes in India and accusing the Indian elites of escaping climate-change responsibilities by putting the poor in the frontline of ICCN (Parikh et al., 2009). But since the report came out shortly before the 2007 Bali COP, it was also criticized within India because it was in accordance to the ICCN rhetoric that urges Indian middle class to take the lead in emission reduction obligations (Dubash, 2013).

increased from 11% to 35%. The largest source of import increase, crude oil, accounted for 70% of the total increase. More alarmingly, its crude oil import dependence increased from 61% in 1990 to 81% in 2009 (IEA, 2012b).

3. Stagnating domestic energy/power reforms that failed to alleviate energy poverty and supply sufficient energy to meet the escalating demand for economic growth:

As of 2009, India had already developed the world's fifth largest installed capacity for power generation, and had tripled electricity generation between 1990 to 2009. Yet, still 25% - or 289 million - people in India lack access to electricity. Its per-capita electricity consumption remains only one fifth of the world average and 7% of that of OECD countries (Fig.5.5), and far below the growth rate of China (Fig.5.6).

4. Geopolitical contests over foreign energy supply: the unstable geopolitical conditions in the oil rich areas, and China's increasingly aggressive and more successful international energy hunt as compared with India's during that period also added to the growing concerns about energy insecurity in the Indian energy cohort (Aiyar, 2006, Zhao, 2009).

Figure 5.4 India's GDP and energy consumption 2003-2011

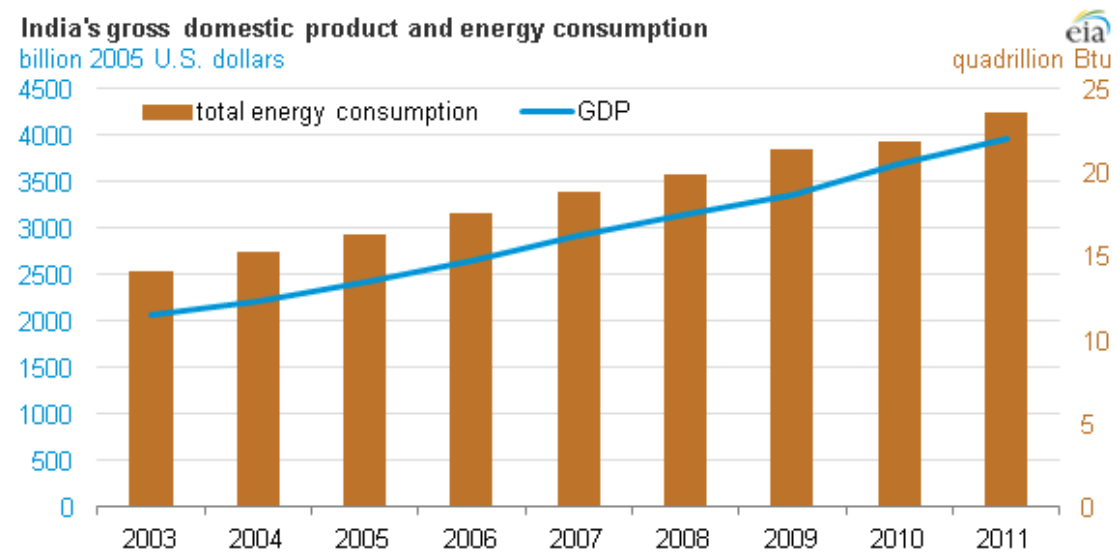
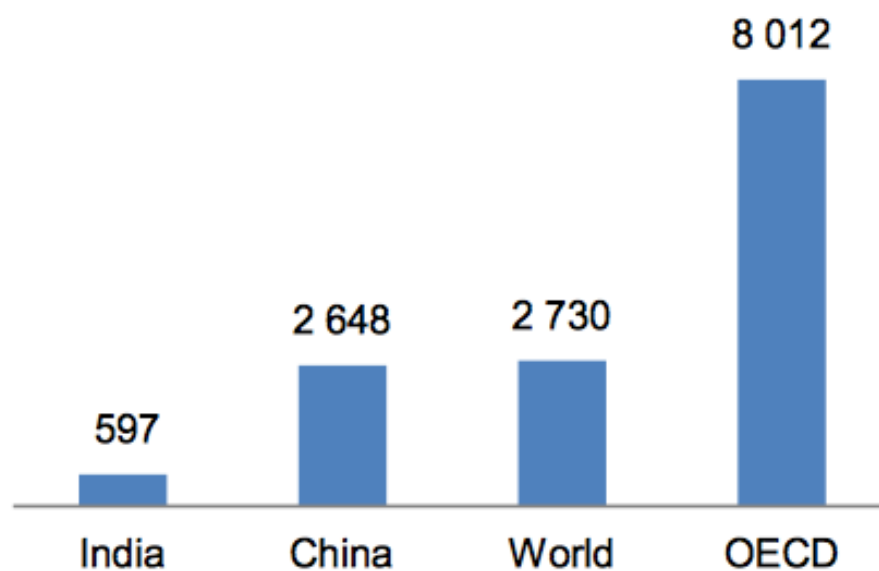


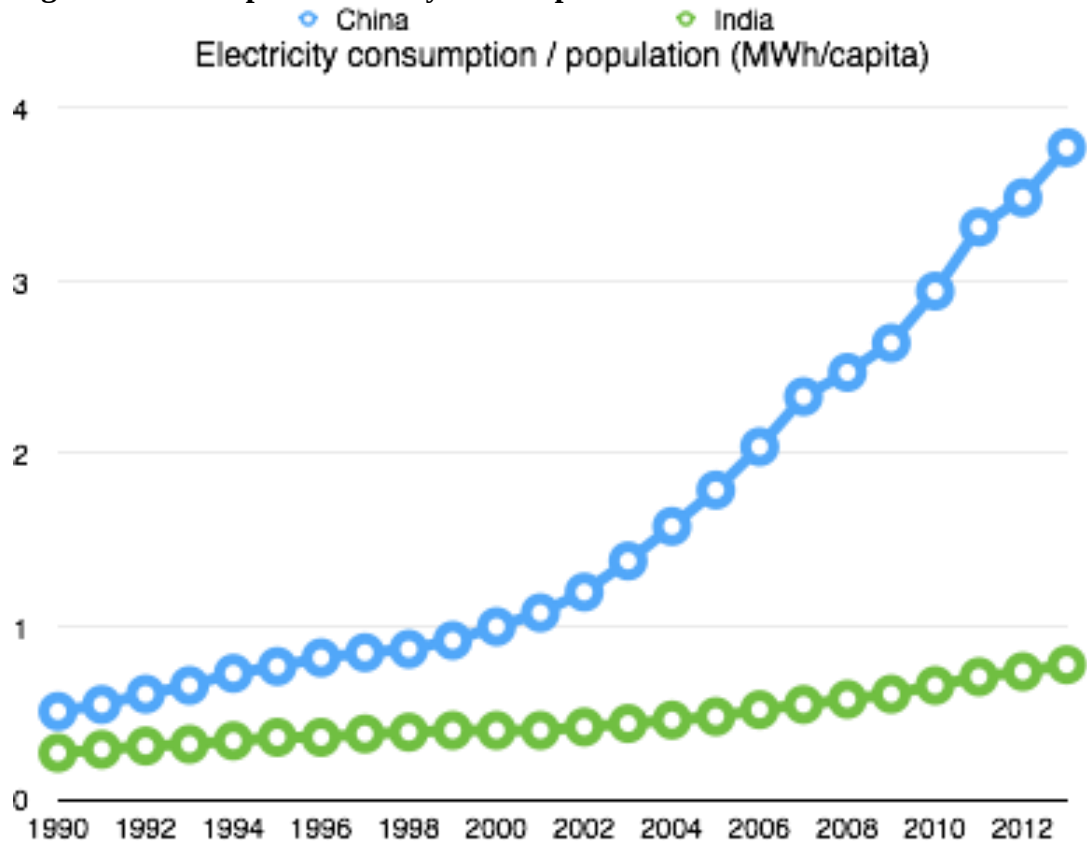
Figure 5.5 India's low per-capita electricity consumption in the world

Per-capita electricity consumption (KWh/capita)



Source: Fig. 9 from IEA (2012, p. 29).

Figure 5.6 Per capita electricity consumption of China and India 1990-2013



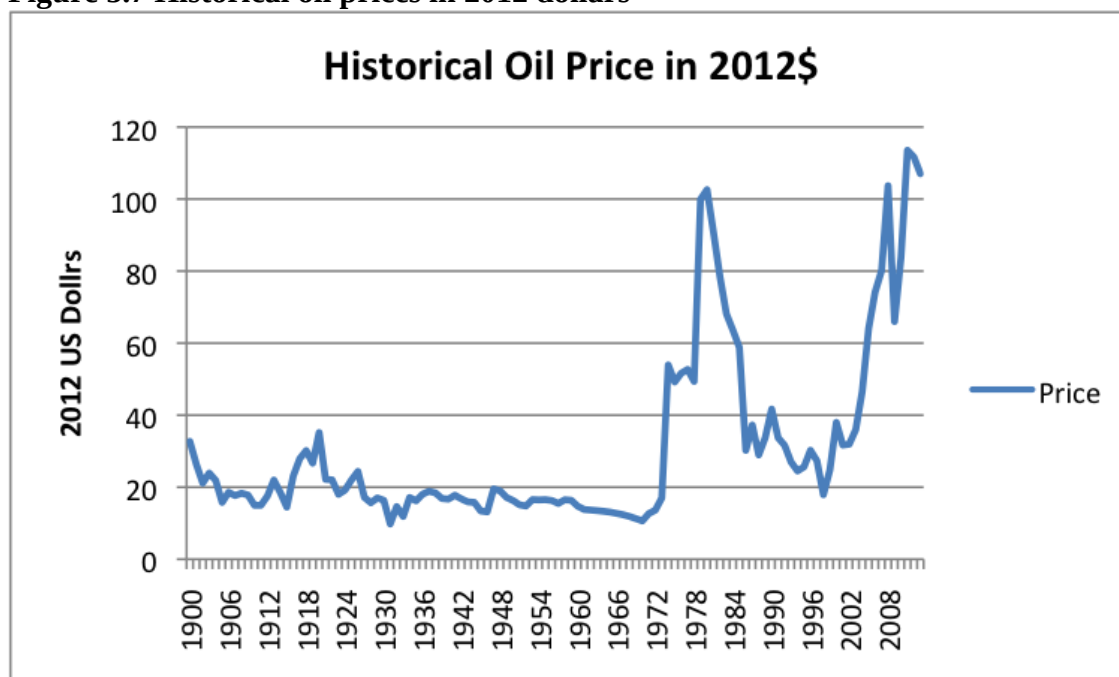
Source: IEA online data. Available at: <http://www.iea.org/statistics/statisticssearch/> [last assessed 28 December 2015].

Under these circumstances, the pursuit for energy security became the paramount and overarching agenda in India's energy governance in an even more pressing way. This also applied to the newly established EE governance and its agenda.

It should be noted that, despite that energy security remained to be pertinent to the Indian energy governance, I do not consider the oil price rise in the 2000s as one of the major triggering effects for the second critical juncture as the first oil crisis did for the first critical juncture in the 1970s. There are mainly two reasons: first, compared to the two sudden oil price hikes in the 1970s, the oil price rise from mid-1990s to 2000s was a relatively gradual change (Fig. 5.7), which allowed the Indian

government to react in a less unprepared way; second, in the 2000s, the Indian economy, especially the power sector, has become proportionately less dependent on oil than coal (Fig. 5.8).⁹⁴ The share of fuel oil, which is used for the generation of power and heat, has declined rapidly in India's total consumption of oil product from the 1970s to 2000s (Fig. 5.9), indicating the power generation's shift away from oil to coal from the first critical juncture to the second. This change in energy consumption mix made the oil price rise in the 2000s a less threatening factor than it was the case of the 1970s.

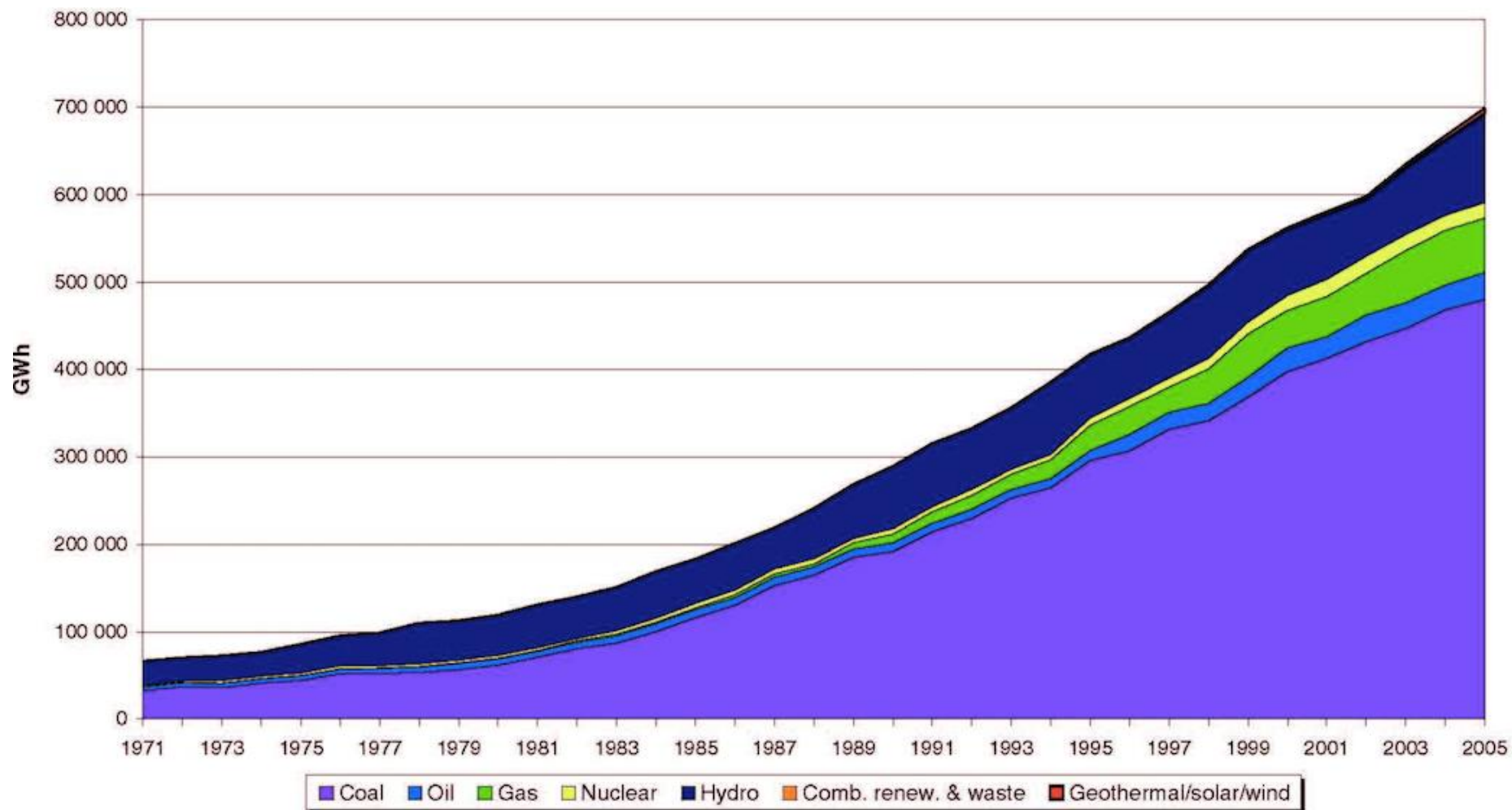
Figure 5.7 Historical oil prices in 2012 dollars



Source: BP Statistical Review of World Energy 2013 data.

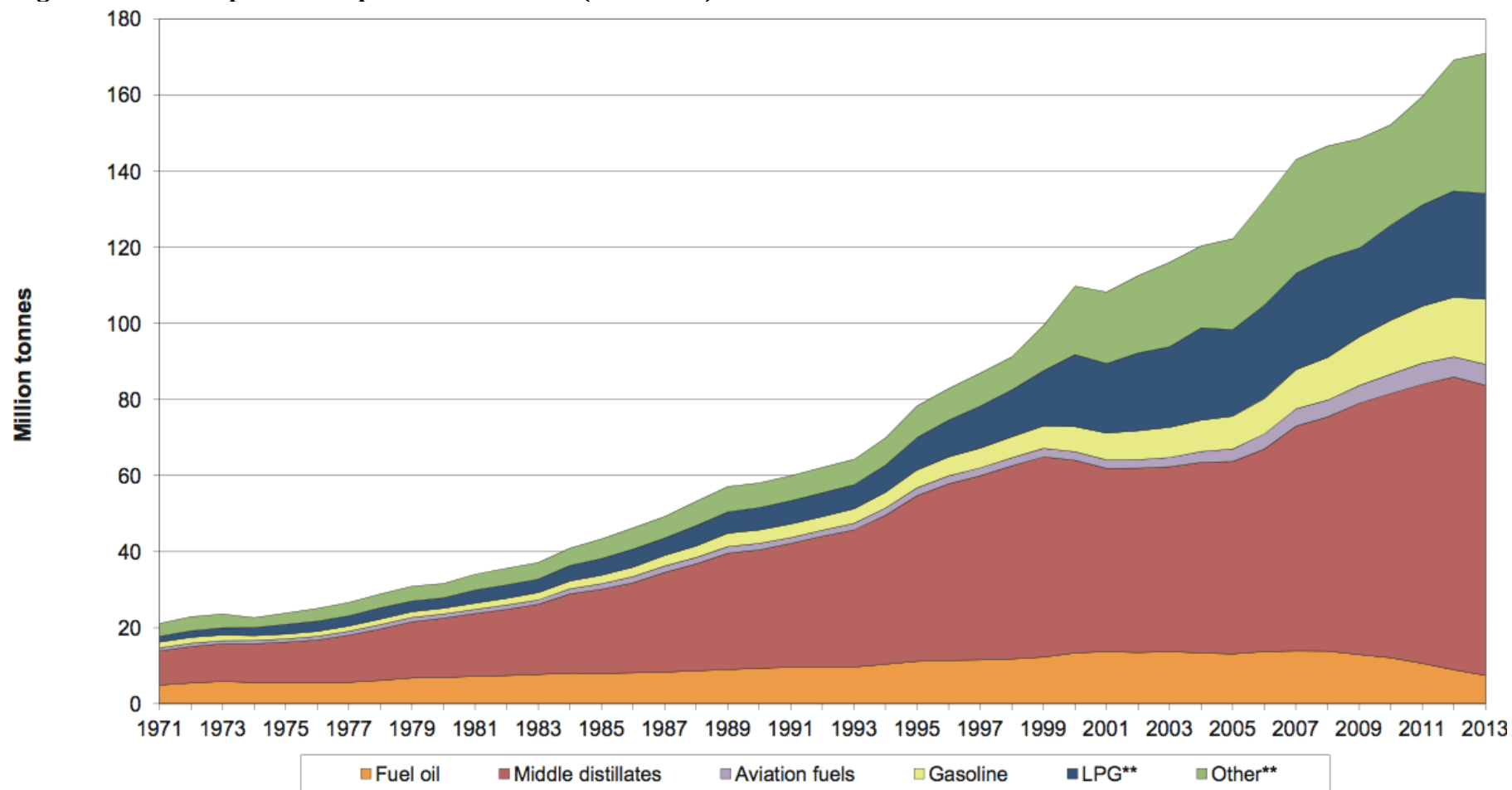
⁹⁴ Also see Table 6.6 & 6.7 in MSPI (2012, pp. 52-56). Available: http://mospi.nic.in/mospi_new/upload/Energy_Statistics_2012_28mar.pdf [last assessed 28 December 2015].

Figure 5.8 Evolution of Electricity Generation by Fuel in India (1971-2005)



Source: IEA data.

Figure 5.9 Consumption of oil products* in India (1971-2013)



* Consumption includes international bunkers.

** LPG includes LPG, NGL, ethane and naphtha. Other also includes direct use of crude oil and other hydrocarbons.

Source: IEA data.

In 2006, GoI had published the Integrated Energy Policy (IEP) – the key comprehensive energy development policy of India for the 21st century. It projected demand and availability of various energy resources, including electricity, coal, oil, gas, nuclear, hydro, and renewables.

More importantly, IEP addressed energy security as the central threat to India's sustainable energy development. This statement, once again, officially bundled energy security with the sustainable energy development agendas: security is the first step and the precondition of sustainability of the energy sector. In doing so, IEP placed EE/EC in the foremost stage of enhancing energy security:

“Actions to improve energy security can be classified broadly into two groups, one that reduces risks and another that deals with the risks after they occur. The major policy options are:

(a) Reducing Risks

- - **Reduce the requirement of energy by increasing efficiency in production and use of energy;**⁹⁵

- - Reduce import dependence by substituting imported fuels by domestic fuels;

- - Diversify fuel choices and supply sources;

- - Expand domestic energy resource base.

(b) Dealing with Risks

- - Increase ability to withstand supply shocks;

- - Increase ability to import energy and face market risk;

- - Increase redundancy to deal with technical risk”. (SOURCE, DATE, p. 57)

Considering that EE/EC are one of the most important ways to realize energy security the government's stance remained consistent during the first critical juncture of EE development, when EC/EE was first conceptualized by India's policy cohort as the most important “hidden fuel” (ABD, 1986). The first specific policy chapter following the overall energy scenario and policy option analysis chapter of the IEP was *Chapter VI. Policy for Energy Efficiency and Demand Side Management (DSM)*.

⁹⁵Emphasized by the author.

IEP stated that up to 25% of energy intensity reduction could be achieved with appropriate technologies and policies to maximize EE and DSM. It also set specific EE targets for certain sectors of the economy.

Following IEP, India's 11th FYP (2007-2012) stressed the severe energy shortage, the dominance of coal and the need for EE and renewable energies as well. Moreover, it set a target of a 20% increase in EE by 2016-17. Although this target was set to be achieved in a longer period than China's "20%" in 11th FYP (2006-2010), it represented an impressive step toward EE, especially taking into consideration India's historical reluctance in setting concrete plans for EE and broader LCD.

However, both the IEP and the 11th FYP were not well implemented as a whole. The targets set were not met, or even mentioned afterwards. Despite the need for a strong energy insecurity drive to more effective EE as stated in the two policy documents, yet another important parameter – India's development agenda - added an opposite angle to the conceptualization of EE in this period – addressed in the next section.

5.2.2 “Co-benefits” with development

Historically, one of the barriers to achieving EE in India was the distorted energy pricing system (IEP, 2006). In particular, India kept electricity rates low to promote spreading electricity use in rural areas. However, the poorly designed and implemented poverty relief and equity-oriented policy reversed its policy purposes. India's 11th FYP identified that the low electricity and water tariffs as a result of a subsidy as high as 80-90% in rural areas of most States, directly led to gross overuse of both electricity and groundwater. Such an institution provided negative incentives for EE in large and medium sized energy consumers in rural areas, i.e. farm owners

and village factory owners (Swain and Charnoz, 2012). On the contrary, it did not necessarily benefit the poor: official data showed that by 2006, only 55% of rural households in India were electrified - over 20 million households were left without power (MOSPI, 2006).

Such contrasting scenes of “development” focused on energy policies – on the one hand spending huge amount of government tariff subsidies in the name of “poverty alleviation” and “supporting agriculture”; on the other, leaving the most-in-need poor rural households without basic electrification - constitute a typical example of how the actual policy process of development objectives not only failed its own development goals, but also imposed barriers for EE and LCD (Cust et al., 2007, Swain and Charnoz, 2012).

Nevertheless, the readily mobilized political support for the development rhetoric seemed to have provided the most plausible partner for EE to ally with. In 2008, soon after setting up PMCCC, India stated that they would approach climate change on pursuit of “co-benefits” between development objectives and mitigation. The “co-benefits approach” was produced to respond to the political concerns raised especially by India’s energy policy circles. Promoting clean energy and EE could be strategically harmful, because it could be interpreted as India’s using its limited resources to undertake climate mitigation, which could be otherwise used for development objectives (Dubash, 2013).

The consequence of such an approach imposed yet more obstacles to EE mitigation’s raising the necessary public resources. In the first instance, the development rhetoric

hinted that EE should not harm the priority of development in any way. In the next, since the government had very limited resources, setting a boundary for EE became necessary - the government should dedicate itself to ‘development’ whole-heartedly, while ‘EE’ should be taken care of by the market and not rely on government support. The financial crisis and domestic economic slowdown again reinforced this non-government-subsidy and market-based institution for EE in India.

5.2.3 Setting a clear boundary for EE: market-based

Energy insecurity and the development-first rhetoric, India’s twin policy priorities, to which LCD/EE has been linked, seemed to be compatible with political prioritization and the development of LCD with sufficient political resources. Yet in fact they underscored poor performance in this respect. Meanwhile, the incompatible alignments (state resources should be minimized for EE promotion, and the market should play a central role) boded well for the existing EE institutions that formed from the first critical juncture in India. Spontaneously, the fiscal austerity from 2010 (Figure 5.2 & 5.3, Sen and DasGupta, 2014) provided an even stronger political and economic legitimacy to this policy logic.

The most important message from NMEEE (2008), the key EE policy document in the second critical juncture, was the paramount emphasis of “market-based approaches to unlock energy efficiency opportunities, (which were) estimated to be about Rs. 74,000 crores”. The first three out of the main four proposed policy schemes in NMEEE were centred on the idea of the “market mechanism”. The fiscal arrangement is mentioned in the end:

“-Perform Achieve and Trade (PAT) -A market based mechanism to enhance cost effectiveness of improvements in energy efficiency in

energy-intensive large industries and facilities, through certification of energy savings that could be traded.

-Market Transformation for Energy Efficiency - Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable.

-Energy Efficiency Financing Platform - Creation of mechanisms that would help finance demand side management programs in all sectors by capturing future energy savings.

-Framework for Energy Efficient Economic Development -Developing fiscal instruments to promote energy efficiency.”

Compared with China’s ECER scheme that covered nearly every economic activity within the embodiments of many political, economic and social development agendas, India’s NMEEE set very clear and limited boundaries for EE. The latter reflect a strict adoption of the internationally recognized technological EE/EC concept – “efficient use of energy and its conservation”.⁹⁶ The NMEEE set out very clearly targeted areas of EE, which the government considered technologically and financially viable. However, those focused areas did not address several crucial barriers to the enhancement of EE in the Indian context, including:

- The distortion of power pricing system that gave perverse incentives for EE;
- The organizational reforms that were correctly identified and strongly recommended by IEP in strengthening BEE’s independency and capacity (IEP, 2006, p. 88);
- No government agency was designated to be responsible for forthcoming compulsory EE targets.⁹⁷

⁹⁶ Revealed in the Energy Conservation Act 2001as well. See the BEE website: http://www.beeindia.in/content.php?page=about_bee/about_bee.php?id=4 [last assessed 19 June 2015].

⁹⁷An aim of an annul fuel savings in excess of 23 million toe, cumulative avoided electricity capacity addition of 19,000 MW and CO2 emission mitigation of 98 million tons per year by

- No concrete plan existed to mobilize government support for EE.⁹⁸

In IEP (2006), there was still a well-acknowledged association between EE and some social development agendas, such as poverty alleviation and sustainable development. When it came to NMEEE (2008), the clear-cut boundary disassociated EE from the non-market-focused agendas. Rather, a purely market-based approach that perceived EE as a problem of commercial sectors (notably commercial buildings and industries), as well as a business opportunity was formalized through the key EE policy documents. In addition, an EE market of Rs. 74,000 crores that equaled approximately 2% of Indian GDP 2008-09 was projected. Contrary to the initial “co-benefit” framework, NMEEE (2008) did not even mention the potential “co-benefit” between EE and the development objectives other than commercial business.

This pure market-focused EE policy scheme distinguished itself from most of the policy documents in India during that period, which continuously stressed their connections with social development apart from economic growth. According to the rational choice approach of institutional change theories, players inside the game make rational choices that would maximize their interests. The given institutional context shapes people’s rational choice by giving rewards to those who made choices in accordance to the institutional rules (North, 1990). However, the pure market based framework conceptualized for India’s EE cannot be fully explained by rational choice theory. This is because, in the Indian policy context, defining one policy closely with an economic growth agenda while disconnecting it from the “development rhetoric”,

2014-2015 was set in IEP (2006). But those aims are not compulsory target, meaning that no one would be punished if the goal was not achieved.

⁹⁸NMEEE merely laid out the regulatory, promotional and coordination support of the government.

may lead to reduced public support and governmental investment. Then, what were the rationales behind India's ostensibly irrational choice in conceptualizing the policy field for EE/EC during the second critical juncture?

The answer was exposed, once again, by Dr. Mathur in fieldwork interview in April 2014:⁹⁹

“India's EE can and can *only* be developed through a market based approach, because we are still a very poor economy. India has the largest population on earth without sufficient power supply. Under this circumstance, spending subsidies for EE cannot have public support. Since the constitution of BEE, we were very clear about the fact that, government subsidy for EE was not an option. So we have no other choice but to focus on the market.”

In other words, the seemingly “irrational choice” of India's EE conceptualization approach, was actually rationalized by the multiple political, economic, and institutional constraints it was bundled with. This choice was a reflection as well as a reinforcement of the EE institutions formed from the first critical juncture.

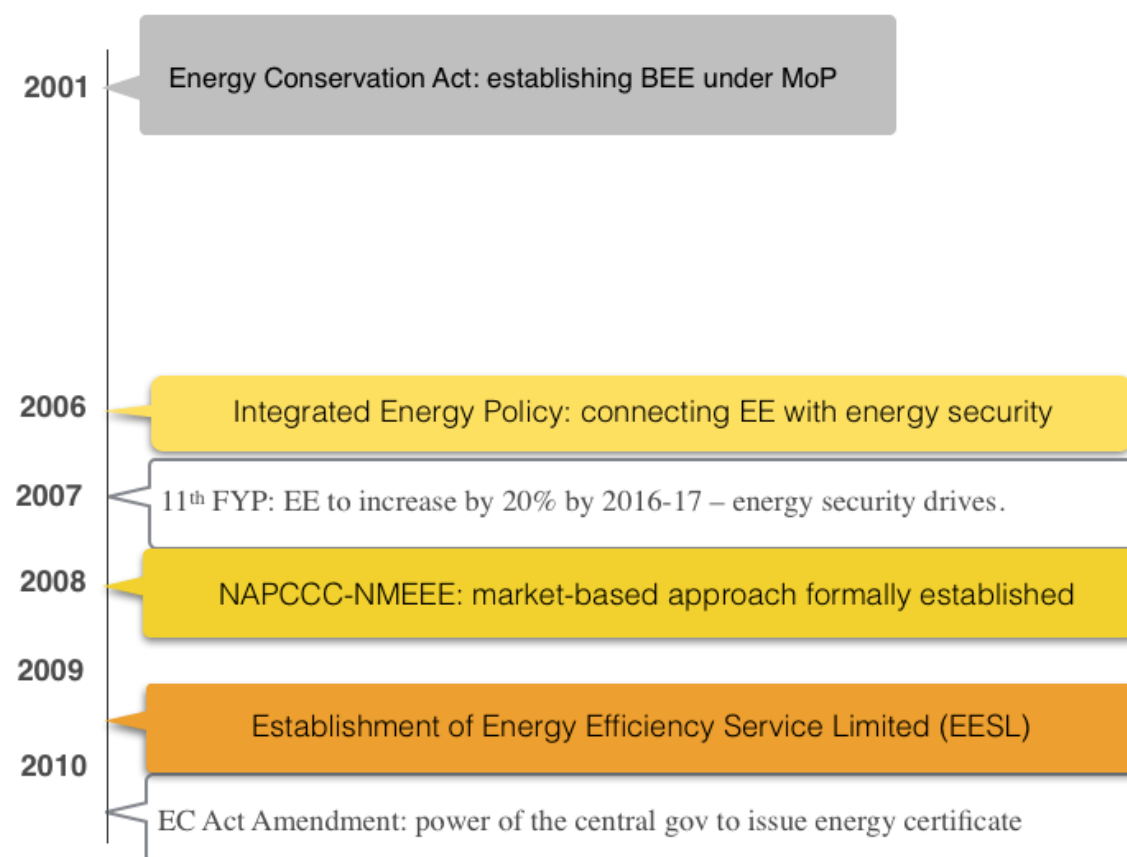
To briefly summarize, as was the case in the first critical juncture, in the second critical juncture the energy security agenda allied with the external crisis (ICCN) to push forward EE agendas that had stagnated somewhat since 2001. In the meanwhile, the difficult fiscal situation due to the financial crisis further disconnected EE from India's development agenda. Through the NAPCC and NMEEE, EE was framed into a market-centered approach that was almost irrelevant to social development. This self-reinforcing conceptualization process made the market-based approach the backbone of future EE development. Within this framework, EE disengaged from the

⁹⁹Location: Director's Office, BEE, New Delhi, India.

legitimacy of development. The market mechanism became the major institution for EE development.

This institution fundamentally structured all arenas of EE organizational development and all policy practices for authorization, establishment, resource mobilization and distribution that the following sections will elaborate.

Figure 5.10 Timeline of conceptualizing the policy field for EE in India's second critical juncture



5.3 Organizational change: BEE's struggle for survival

Following my five-phase analytical framework, after examining the phase of contextualization of the triggering events and the conceptualization process of the

LCD policy field, this section focuses on the organizational development of India during the second critical juncture. I am going to focus on the organizational change of India's nodal government agency dedicated for EE development - BEE. This investigation is aimed at showing a continuous struggle of BEE within the complex energy hierarchy of India. I start with analyzing the fragmentation of the EE regime's host governance structure, then move on to discuss the disadvantaged development environment for EE organizations. Finally, I map out a network of semi-government organizations for EE promotion that was developed within the multiple institutional constraints.

5.3.1 Host governance: fragmented “energy security” regime

Despite its significant importance for economic and social development, India's domestic energy governance is understudied in international academic literature. One of the reasons for the limited scholarship is the difficulty of assessing data, especially information on the policy process. India's energy policy-making remains a “black box” outside the policy insiders. Even for the policy cohort, the fragmentation and sectoralisation of energy governance made it almost impossible even for policy insiders to form a holistic and well-informed perspective about this governance complex.¹⁰⁰

The most widely cited paper on India's mysterious energy governance to date remains Madan (2006)'s India paper as part of the Brookings Foreign Policy Studies Energy Security Series. In that paper, Madan argued -

“To date, India has developed a cluster of energy policies rather than an overarching energy strategy. Ideology, politics, and processes have complicated the country's quest for energy. Attempts at integrating energy

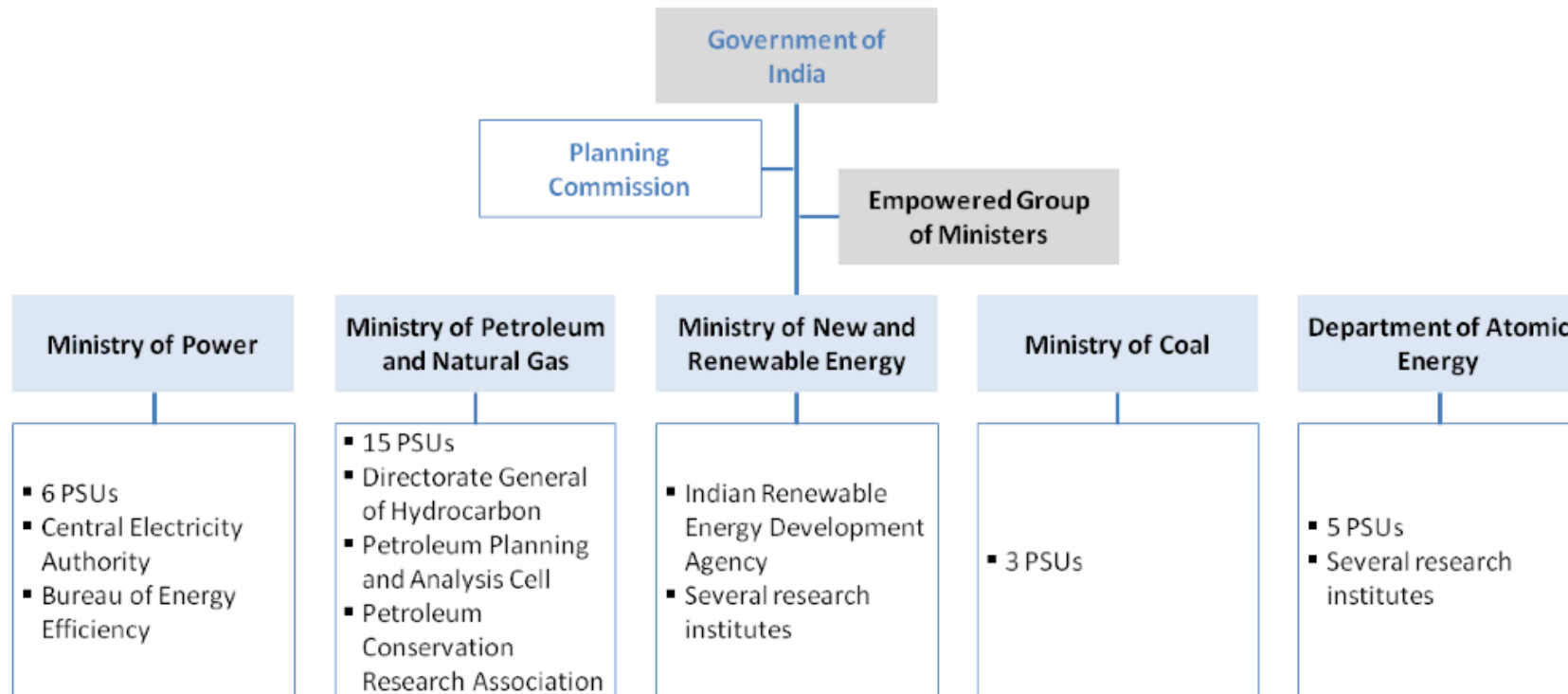
¹⁰⁰ Casual conversation with ministerial level policy insiders in November 2013.

policies have been hindered by separate entities overseeing each type of energy source, as well as by stove-piped policy-making on related issues of foreign affairs, economics, and the environment. And the realities of domestic politics and socioeconomic concerns have curbed policymakers' willingness to make tough, yet necessary, choices." (Madan, 2006, p. 1)

With a focus on the oil sector, the paper vividly depicted the fragmentation of India's energy regime that each of the government players, ranging from the energy-related ministerial authorities, central and local governments, to various energy sector PSUs, have separate rather than integrated agendas. Also, the implementation process lacks both coordination and efficiency (Madan, 2006).

Nevertheless, though India lacks an overarching energy strategy, its disintegrated energy regime does enjoy a strong consensus about prime objectives – energy security (external) and universal energy access (internal). In that way, the energy regime in India presents an ominous tension – on the one hand, all of the sectoral players within the governance regime ultimately share common goals of the “game”; on the other, despite acknowledging the fact that “the goals of the game” have to be realized through strategic and continuous alignments between the segregated sectors, each sector persistently plays out these goals on its own. This tension forms the foundation of the functionally fragmented, yet ideologically unified energy security regime of India. Under the constraints of such a governance structure, EE development faced a disadvantageous host environment.

Figure 5.11 India's energy governance complex (2012)



Source: Fig. 3 from IEA (2012, p.18).

5.3.2 A disadvantageous organizational environment

The dilemmas of India's energy governance have created an uncooperative and tense hosting environment for the EE regime. Such a bundling environment imprinted two dimensions of embeddedness onto EE organizations:

1. EE is always **sidelined** compared to energy security and energy poverty eradication, the twin energy governance goals;
2. EE organizations have to **survive within the fragmented authorities** of the energy governance structure, especially of the power sector.

The power sector is at the centre of India's energy governance (IEA, 2012). It accounts for 38% of India's total primary energy demand, and this share is expected to increase to 47% in 2035 (IEA, 2011). The MoP, the host ministry for the BEE, is one of the most sophisticated giant ministries in India's energy bureaucracy. It embodies at least 8 clusters of functioning units, within which, EC/EE is the most recently formalized sector and is equipped with the least manpower and financial resources (IEA, 2012b):

1. Central Electricity Authority - policy planning.
2. Electricity generation PSUs - NTPC, NHC
3. Transmission and Distribution PSUs - Power Grid
4. Power Finance agency -Power Finance Corporation, Rural Electrification Corporation
5. Power Trading PSUs - PTC, IEX
6. Regulatory Organizations - Central Electricity Regulatory Commission (CERC), Appellate Tribunal for Electricity
7. Energy Conservation - BEE, EESL
8. Research & Training - Central Power Research Institute (CPRI), National Power Training Institute (NTPI)

As happened in China, EE was a constituent of India's national policy package responding to climate change. Despite BEE's dependent organizational status within the powerful MoP, it was represented in the PMCCC. Dr. Ajay Mathur, Director of BEE was one of the 13 Government representatives. Among all the represented central government agencies in PMCCC, BEE was the least powerful and well resourced.¹⁰¹ Nevertheless, the acknowledgement of BEE's contribution to national climate change action does not necessarily guarantee a supportive organizational environment within its host governance structure. Having explained in the previous section that although EE was proposed as a crucial way to bring in potential "hidden fuels" to enhance energy security (ABE, 1986) (IEP, 2006), in fact, EE has been portrayed by the government as the least relevant factor for the twin energy governance agendas. The compulsory initial subsidy for EE - together with its newcomers' status placed BEE in a disadvantaged organizational and policy position in governance structure of the energy and power sectors.

The following section shows how EE organizations – BEE, the nodal central government agency for EE development, and a network of non-state and semi-governmental players manoeuvred to survive in such a constrained and complicated governance environment.

¹⁰¹ Other members of the PMCCC included: Minister of External Affairs, Finance Minister, Minister of Environment & Forests, Minister of Agriculture, Minister of Water Resources, Minister of Science & Technology, Deputy Chairman, Planning Commission, Principal Scientific Advisor to PM (Dr. R. Chidambaram), Chairman, National Manufacturing Competitiveness Council (NMCC) (Shri V. Krishnamurthy), Chairman, Economic Advisory Council to the Prime Minister (EAC) (Dr. C. Rangarajan); Foreign Secretary; Secretary, Environment & Forests and Principal and Secretary to PM (Convener). See: <http://www.pib.nic.in/newsite/erelease.aspx?relid=28457> [last assessed: 21 June 2015].

5.3.3 A network of policy shapers, financiers and negotiators

An important characteristic of India's power sector governance is that, apart from BEE, all the other clusters of administrative bodies – power regulation, generation, finance, transmission and trading, and research – are exclusively state-owned. Non-state players have very limited influence under this government-authorities-and-PSUs-led “rules of the game”. State ownership partly contributed to the opaque policy process in India's energy sector. Non-state players seldom get a chance to participate in crucial policy stages.

On the contrary, BEE represents one of the most NGO-friendly government organizations in India's central bureaucracies. Even before the formal date of its birth in 2001, its emerging bureaucracy worked in close collaboration with diverse domestic and international NGOs. The following three cases show how different types of NGOs - foreign donors, think tanks and public-private enterprise – formed a complex network to attempt to realize EE under the constrained host governance structure.

5.3.3a Foreign Donors: the case of USAID

As early as January 2000, USAID initiated a bilateral agreement with GoI, called “The Energy Conservation and Commercialization (ECO) Program”. The agreement was aimed at enhancing commercially viable, clean and energy-efficient technologies in India's energy sector - through US-India collaboration. After the Energy Conservation Act was enacted in 2001, the first phase of this collaboration scheme, ECO-I Project, played a critical role to help establish BEE. This role included setting up procedures and authorities, establishing office facilities and assisting in several activities leading to the development of BEE's Action Plan, such as the energy

auditor certification program. Following the ECO-I Project, USAID initiated ECO-II, the stage two project of the US-India EE/EC collaboration scheme. ECO-II provided BEE with necessary technical assistance and training support to implement three thrust areas of BEE's Action Plan:

1. developing the Energy Conservation Building Codes (ECBC),
2. developing energy conservation strategy and implementation for the Maharashtra Energy Development Agency, and
3. implementing a pilot DSM program to replace incandescent lamps with CFLs in the state of Karnataka in partnership with BESCO. Building on the earlier phases of the ECO projects, the next step was the ECO-III Project that aims at further assisting BEE and GoI in implementing the Energy Conservation Act 2001.¹⁰²

The strategically designed and continuously implemented ECO project showed the USAID's crucial support for BEE's institutional formation and policy shaping. Apart from the US, other foreign donors, including the World Bank, WWF, Germany Agency for International Cooperation (GIZ), Japan International Cooperation Agency (JICA), Swiss Agency for Development and Cooperation (SDC), Department for International Development UK (DFID), French Development Agency (AFD) etc. all actively took part in the EE policy activities of India. Apart from the direct partnership with BEE, foreign donors - as important financiers for EE - also collaborate closely with various Indian NGOs in aspects of research, policy planning, capacity building and public outreach.¹⁰³

¹⁰² See the USAID India official website: <http://www.eco3.org/about-us/> [last assessed: 21 June 2015].

¹⁰³ According to interview with Dr. Veena Jushi, The Swiss Development Agency. March 2014, New Delhi.

On the one hand, foreign donors were eager to influence India's EE policy for two reasons. First, they think India's EE is crucial to the global efforts to mitigate climate change; second, they tend to believe that EE is a technocratic and depoliticized area that foreign donors can penetrate to make a bigger impact with little suspicion by the Indian government of foreign political interference.¹⁰⁴

On the other, given the extremely restricted government funding and reluctant private investments, foreign-donors' money became the most resourceful provider for the various domestic EE development policy groups. Through financing, collaborative research, and knowledge sharing, foreign donors became critical policy drivers, shapers, and financers of India's EE development. They formed an important part of a network of EE organizations in India.

5.3.3b Think Tanks: the case of TERI

Among all of the various NGOs working on EE, TERI is the most gigantic and influential organization. It plays a significant role in shaping India's EE development. It not only carries out extensive policy oriented research, but also conducts energy auditing for industries. More importantly, as a powerful policy group, it does effective policy advocacy and lobbying with various governmental authorities, foreign donors and business practitioners. Further, it even provides technical and policy-making personnel for governmental, semi-governmental, non-governmental and commercial EE organizations.

During fieldwork interviews, a fellow from TERI who is an EE policy insider described BEE as "a baby of TERI". Since the 1980s, TERI was intensively involved

¹⁰⁴Interviews with officials from AFD, SDC and WWF in January – April, New Delhi.

in the early stages of policy advocacy for an independent EE authority. TERI also started international collaborations on EE research with China. One of its far-sighted initiatives was to conduct joint research on EE development with Tsinghua University in China during the 1980s, representing the first-ever China-India collaboration in LCD in the contemporary world.¹⁰⁵ Since in the early 1980s, China had just opened its door to foreign research, and EE in India was still a concept rather than an actual policy regime, this China-India EE research collaboration indeed reflected TERI's long-term vision and dedication to EE.

TERI was also among the first Indian NGOs to collaborate extensively with foreign donors in conducting energy audits for industries. Since 1990, TERI's Bangalore Office has been dedicated to the energy audit business.¹⁰⁶ According to Mr. Girish Sethi, Director of Industrial Energy Efficiency Division at TERI, due to the emergence of commercial energy auditing companies since the Energy Conservation Act 2001, TERI's marginal profits from industrial energy auditing had declined to near-zero, due to the high cost of highly skilled workers and the modest price of the service. TERI however has continued doing this intelligence-intensive but not very cost-effective business because it helped the organization to be in close relationship with actual business practice.¹⁰⁷ TERI's close involvement with, and long-term expertise in the industrial energy auditing and other EE related sectors, gave it

¹⁰⁵This report is not archived in the TERI library, but the existence of it is double confirmed by several TERI fellows who involved in the expert exchange program with Tsinghua University for this report, including Dr. R K Pachauri and Dr. Veena Joshi.

¹⁰⁶See TERI-SRC Bangaluru office website: <http://www.teriin.org/teri-src/about> [last assessed: 21 June 2015].

¹⁰⁷During TERI's annual staff meeting held in TERI University in March 2015, staff from the Bangalore office seriously raised the issue of the labor intensive energy auditing service that brought limited profit but involved a lot of professional time and energy. During my interview with Mr. Girish Sethi, he gave the explanation in my text (above). His testimony is double confirmed by casual conversations with several other senior fellows in the Industrial Section of TERI.

advantages when taking part in the policy process of industrial EE as India developed its major industrial EE policy. For instance, TERI played an important mediating role in the policy negotiation process of the Performance, Achieve and Trade (PAT) scheme, India's first-ever compulsory EE target-focused policy scheme that was launched in 2012. The process required negotiation with multiple ministries, State governments and various industrial associations, and took almost a decade.¹⁰⁸

In terms of personnel connections, TERI established a strong network consisting of current and former policy makers, NGOs, diplomats, academics and industries. After the establishment of the BEE, a former TERI fellow, Dr. Ajay Mathur became the second and the longest serving Director of BEE to date. Several former TERI staff established their own EE consultancies and Energy Service Companies (ESCOs) to work with government or foreign donors funded EE programs at the national, subnational and community level, such as Dr. Sameer Maithel, Founding Director of the Greentech Knowledge Solutions Pvt Ltd and former Director of Energy-Environment Technology Development (EET) Division of TERI. In addition, several members of the PMCCC at the same time served as TERI's Distinguished Fellows or Directors, such as Ambassador Chandrashekhar Dasgupta, Dr. Prodipto Ghosh, and Dr. R. K Pachauri. Dr. R. K Pachauri also served as the Director of IPCC for more than a decade. Apart from the government connections, TERI hosts former senior members of influential PSUs in the energy sector as well, such as Dr. Shiv Kumar Dube, Senior Fellow for the Centre for Resource Security and Development Policy, Resources, Regulation and Global Security Division (CRSDP-RRGSD) at TERI, who

¹⁰⁸Interview with Mr. Girish Sethi in April 2014, TERI, New Delhi.

worked in senior management positions (e.g. General Manager with the NTPC Limited) before retirement.

Through the multi-layered channels of research engagements, business collaborations and personal connections, TERI maintains a significant relevance to different international, national, subnational, and community level EE stakeholders throughout the government, PSU, research and business sectors. Such a powerful non-government funded think-tank's role in EE/LCD is quite distinctive – compared with China's government-dominated landscape.¹⁰⁹

Think tanks like TERI are no less skilled than governmental organizations in understanding and making use of the complicated and fragmented governance landscape of India's energy sector. Exercising under the EE regime's highly constrained organizational and resource status, think tanks and NGOs acquired rich experience and the competence to reach out to all kinds of possible authorities/stakeholders for policy advocacy. They took every opportunity for policy advocacy within the energy governance system that does not rely purely on the state's EE regime. Their active and often creative maneuvers have played important roles in shaping organizational and institutional environment of EE development.

A typical example happened in the development of EE in India's construction industry. To address the 30-50% EE/EC potential in India's commercial buildings, in

¹⁰⁹During fieldwork scoping, several policy insiders expressed the view that TERI cannot be considered as a NGO anymore, because of its intimate relationship with the government and the business groups. By saying TERI is an NGO, I adopt its own declaration and how it is publicly acknowledged and registered. But I bear in mind TERI's distinction from the other NGOs in India's LCD field. I use the example of TERI to show how policy groups, especially think tanks manoeuvre within institutional constraints. I do not intend to generalize TERI's case to other non-government EE/LCD players.

May 2007, the Energy Conservation Building Code (ECBC) was launched by BEE with substantial support from USAID. ECBC set minimum energy standards for the design and construction of commercial buildings. It was introduced as a voluntary program for new commercial buildings having a connected load of 100 KW or 120 KVA and above, after extensive consultation with architects, industry associations, suppliers and government departments (Chaudhary et al., 2012). ECBC aims for the voluntary adoption by state governments of a building EC code to be made mandatory later on.¹¹⁰

BEE was designated as the nodal government agency in charge of the ECBC. Around the same time ECBC was under discussion, a green building rating system was being developed by TERI, but in collaboration with the Ministry of New and Renewable Energy (MNRE). This rating system is called Green Rating for Integrated Habitat Assessment (GRIHA), which is an Indian version of Leadership in Energy & Environmental Design (LEED), an American-originated and globally used green building certification program. In the same year of BEE launching the ECBC, the MNRE adopted GRIHA. Consequently, MNRE became the nodal government agency for developing India's green building rating system.

¹¹⁰ Rajasthan is the first state in India to adopt ECBC as a mandatory code. The State adopted ECBC with minor additions on March 28, 2011 through a stakeholder process; it became mandatory in Rajasthan on September 28, 2011. The State of Odisha and the Union Territory of Puducherry also amended ECBC and sent out notifications for mandatory adoption recently. According to the Bureau of Energy Efficiency (BEE), 16 Indian States are now in various stages of ECBC implementation and adoption, and these also include Uttar Pradesh, Karnataka, Uttarakhand, Kerala, Punjab, Gujarat, Haryana, Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Maharashtra, Chhattisgarh, and West Bengal (Yu et al., 2013).

As a result, in the area of construction EE, a further governance fragmentation appeared: BEE takes care of the ECBC, while MNRE looks after GRIHA. One would wonder, if BEE was already in charge of EE for buildings, why did MNRE take on the responsibility of green building rating? Why did BEE not adopt GRIHA so that BEE's authority over EE in construction could be enlarged and strengthened as it should be? In China, EE in construction is to the subject of Ministry of Housing and Rural-Urban Development, of which the Indian equivalent is Ministry of Urban Development (MUD). In India, MUD and its subnational and local branches are the actual regulators for building EC/EE once ECBC is adopted as mandatory code. Then, why is MUD not involved in the case of India's building EC?

With those questions in mind, I interviewed three TERI staff members who work or have worked for the GRIHA and building EC/EE sector. Then an interesting story came into light.¹¹¹

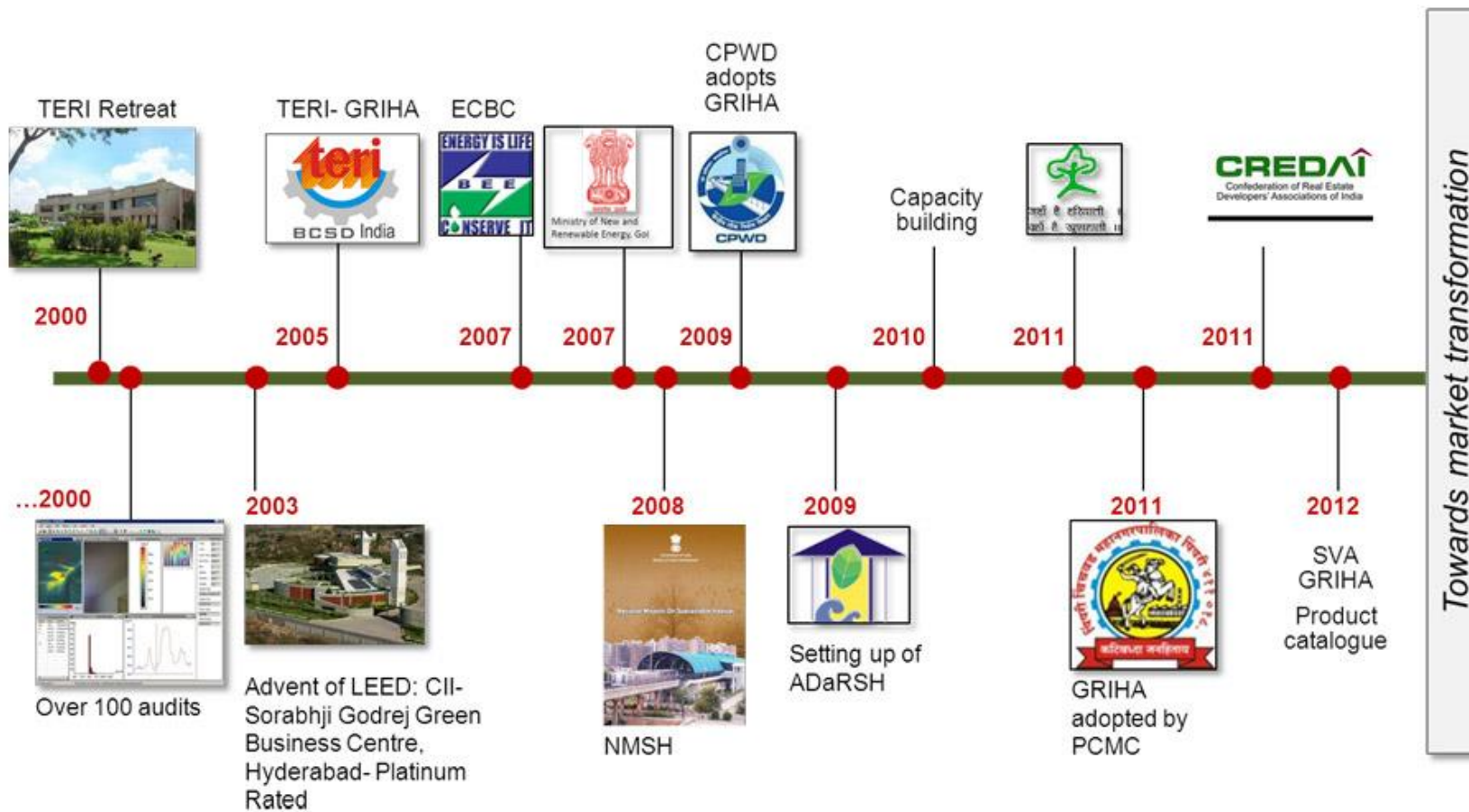
In the late 1990s, with substantial experience of energy auditing, Dr. Pachauri and a few senior fellows at TERI realized that EE/EC in construction would become one of the pillars of India's EE future. Inspired by the successful international LEED program, they felt that India needed a localized green building rating system. So TERI started to develop GRIHA since early 2000s. Ever since then, TERI had been selling this idea to the industries. The Confederation of Indian Industries (CII), one of India's most influential business associations first collaborated with TERI to adopt GRIHA in some pilot building projects. Meanwhile, TERI was also lobbying different relevant ministries for adopting GHRIHA. BEE was approached, but BEE did not

¹¹¹Interviews took place between March and April, 2014, New Delhi.

show much interest because it was occupied by the USAID-led ECBC program. Nor was MUD interested. But one official from MNRE showed interest, and TERI took the opportunity of that one individual official's interest to make MNRE adopt GRIHA in 2007. Later on, that individual official left MNRE and the interest from MNRE declined. Nevertheless, TERI's endeavor to advocate the official adoption of GRIHA continued.

In 2008, as part of the NAPCC, the National Mission on Sustainable Habitat (NMSH) was launched by GoI. MUD became the responsible central government agency for NMSH. One of the missions of NMSH is to increase EE in the residential and commercial sectors. NMSH demonstrates that one of the regulatory measures established for this goal is the "mandating of certification of energy performance for all buildings" (NMSH, 2008, p.82). The TERI-GRIHA rating system was mentioned at least four times in the report as a well-accepted green building ratings system available in the market. One year later, the Central Public Works Department (CPWD), a government agency dedicated for infrastructure construction within the MOD publically adopted GRIHA. With the adoption of CII, MNRE and CPWD, GRIHA moved one step further towards its goal of being the widely adopted "Indian version of LEEDS".

Figure 5.12 Timeline of GRIHA development



Source: GRIHA official website, available: http://www.grihaindia.org/index.php?option=com_content&view=article&id=73
[last assessed: 21 June 2015]

The story of GRIHA showed how the entrepreneurial spirit and manoeuvring skills of TERI enabled them to initiate the green building rating system that navigated through the complex regime of India's energy and urban development governance structure. Think tank organizations and NGOs like TERI, fully understand the constraints and opportunities of the intertwined relationship between the EE regime and a fragmented energy governance structure. Instead of attempting to change the institutional environment, they adopted a more realistic strategy – making use of the fragmentation and the limitations of the host governance structure, and maximizing the non-governmental policy groups' own interests. The consequence was a proliferating yet even more disintegrated landscape of regulation of EE in construction, whereby at least three separate central government agencies – BEE, MNRE and MUD – are intensively involved, yet without proper coordination. Meanwhile, TERI, one of the most successful NGO players in India's EE, became an effective re-inforcer of the existing fractured “rules of the game”.

5.3.3c PSUs joint venture company: the case of EESL

Ever since the establishment of BEE, the shortages of manpower and budget have hindered its development capacity. BEE's weak organizational status and low policy priority within the host governance structure, in addition to its self-marginalized strategy (disconnecting it from the development agenda and purely focusing on market development) altogether disadvantaged BEE from fighting for more government support. Even a decade after BEE was formally established, there were hardly any dedicated sub-national branches for EE/EC. BEE had to borrow personnel and executive capacity from other state-level bureaucracies, such as the renewable energy development agencies and urban development departments for policy implementation at the state and local levels.

Under the highly constrained circumstances at both central and local levels, BEE found itself handicapped to realize its own market development agenda. In February 2010, Energy Efficiency Services Limited (EESL), a joint venture company between four PSUs with equal equity participation (Power Grid Corporation of India Limited, NTPC, Rural Electrification Corporation Limited (REC) and Power Finance Corporation Limited (PFC)) was incorporated. EESL was designed to be one of the main “implementation arms” of the NMEEE.¹¹² EESL seeks to help India “unlock its EE market of Rs. 74,000 crores”.¹¹³ That is to say, instead of granting more resources to BEE (the already existing nodal central government agency for EE), the government decided to create yet another “implementation” organization through a joint venture between four powerful PSUs under the power sector governance.

According to the annual EESL report, published on its public website, EESL’s main job is the “Promotion of the business of energy efficiency and climate change, consultancy services thereof and other related activities” (EESL, 2010, p.8). Its projects overlapped with BEE. For example, the following two EESL projects used to be BEE’s tasks and then were subcontracted to EESL by BEE:

1. Conducting baseline energy audit for all Designated Consumers for the Implementation of Perform Achieve and Trade (PAT) of Bureau of Energy Efficiency
2. Implementation of Standards & Labelling Programme of Bureau of Energy Efficiency¹¹⁴

Apart from that, EESL’s businesses also include the consultancy services that were

¹¹² See the Power Finance Corporation Ltd. website: http://www.pfcindia.com/Content/Energy_Efficiency_Services_Limited.aspx [last assessed 21 June 2015].

¹¹³ See the Solar Energy Corporation of India (a GoI enterprise) website: http://seci.gov.in/content/news_update/seci-and-eesl-sign-mou-for-promotion-of-solar-based-energy-efficiency-projects.php [last assessed 21 June 2015].

¹¹⁴ See BEE website: <http://beeindia.in> [last assessed 1 Aug 2015].

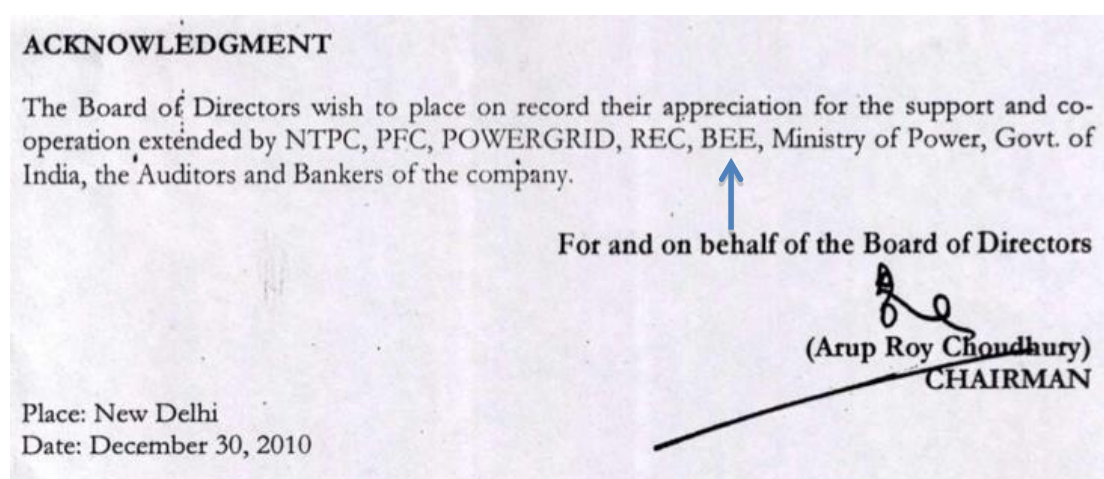
created by BEE policies, including -

1. Energy Audit for state governments owned companies
2. Energy Saving Plan for state governments
3. Corporate Social Responsibility (CSR) report for private companies
4. Energy saving action plan for private companies.

In addition, EESL's registered office is the same as BEE.¹¹⁵ EESL's corporate office is in a separate location yet close to BEE.¹¹⁶

Despite EESL's close business relationship with BEE, the EESL's first annual report did not mention about BEE's role in the management team of EESL. The directory board was constituted by the Nominee Directors of the four participant PSUs. The mentioning about BEE was in the very end of the report's Acknowledgement (Fig. 5.13), along with NTPC, PFC, POWERGRID, REC, Ministry of Power, Govt. of India, and the Auditors and Bankers of the company. It seemed to be a deliberate avoidance to show the intimate connection between BEE and its implementation arm EESL.

Figure 5.13 Acknowledging BEE in EESL first annual report



¹¹⁵ 4th Floor, Sewa Bhawan, P.K. Puram, New Delhi - 110066

¹¹⁶ Hall No. 2, 3rd Floor, NBCC Tower, 15 Bhikaji Cama Place, New Delhi - 110066

Since the second annual report (2010-2011), EESL has taken over the majority of the EE work that BEE had been doing and promoting, including EE in construction, municipal and state level EE planning and private sector EE related CSR reports. EESL has become a major player in the growing business of EE. Its profit (after tax) almost tripled in 2010-2011 (Rs. 337.40 lakhs)¹¹⁷ as compared to 2009-2010 (Rs. 120.78 lakhs),¹¹⁸ and again increased to 501.92 in 2011-2012,¹¹⁹ and 634.35 in 2012-2013.¹²⁰

Interestingly, since the second annual report, EESL's directors have been replaced by professional managers other than the directors of the four PSUs. EESL seemed to be on the trajectory of becoming a professional EE consultancy company. Responding to the question on the purpose of setting up EESL, Dr. Mathur said in interview:

“To increase any manpower or fiscal budget for BEE, we have to first go through MoP, and ask MoP to help us fight for it in the parliament. It is extremely difficult. But without the sufficient implementation capacity, BEE's agendas cannot be realized. So incorporating EESL is a way to establish BEE's implementation capacity. Having said that, the other rationale for EESL was our belief in the market. We want EESL to function by the rule of the market, and to set an example for the latecomers of the growing EE market. EESL has done a tremendous job to help BEE implement the NMEEE. ”

Organizational development is essentially a process of struggle for the policy (rule-making and implementing) power. The formation, deformation and changes of an organization reflect the result of intense competitions, negotiations and compromises

¹¹⁷ A lakh is a unit in the Indian numbering system equal to one hundred thousand (100,000). Rs. 337.40 lakhs equals to approximately 751,000 USD according to exchange rate for 30 September 2010.

¹¹⁸ Rs. 120.78 lakhs equals to approximately 241,000 USD according to exchange rate for 30 September 2009.

¹¹⁹ Rs. 501.92 lakhs equals to approximately 1,054,000 USD according to exchange rate for 30 September 2011.

¹²⁰ Rs. 634.35 lakhs equals to approximately 1,141,000 USD according to exchange rate for 30 September 2012.

between stakeholders. In the case of EESL, a negotiation between BEE and its host governance for more capacity of leading and creating a robust EE market produced the incorporation of EESL. With the help of the four powerful PSUs in the power sector, BEE was able to increase its urgently needed implementation capacity without going through the bureaucratic hierarchy of the energy governance. BEE's creative organizational maneuver, to some extent, echoed TERI's maneuvering strategy within the central bureaucracies.

5.4 Policy development of EE

Following the investigation of triggering events, conceptualization and organizational development, this section discusses EE policy developments in India's second critical juncture. Since the nuanced process of policy making and implementation will be explored by a case study (Chapters 6&7), this section focuses on the relationship between policy development and the institutional environment that formed through the previous three stages.

5.4.1 The gradualist approach: creative maneuver or innovation stage?

While China strategically bundled EE with the overall economic adjustment, political consolidation and social development agendas,¹²¹ EE in India was being institutionalized through constrained financial resources, limited policy scope and a fragmented organizational complex. Thus in India's policy landscape EE had never been able to enter the mainstream policy stage comparable to China's (where EE/ECER became a significant and overarching policy scheme during the 11th FYP).

¹²¹Chapter 6&7 will focus on how EE was aligned with rural development agenda in the 11th and 12th FYP.

Compared to China’s radical target-driven approach, EE policy in India’s second critical juncture developed incrementally and gradually. India’s reform process has been characterized by gradualism (Ahluwalia, 2002). Jenkins (1999) summarized such a strategy as “reform by stealth”, representing a type of incremental, partial and relatively slow reform that does not fundamentally change the governance structure and policy balance of the pre-reform scenario. This gradualist approach seems to have been be transplanted into EE development. I now introduce two representative literatures – the creative manoeuver theory (Kostka and Harrison, 2012) and the innovative stage theory - that suggest this gradualism is characteristic of EE policy, before moving on to connect the gradualist approach with the process of institutionalization.

Table 5.1 Key EE policy developments in India’s second critical juncture

Year	Name of the policy
2006	Standards and Labelling programme of EE appliances
2007	Super EE equipment, 5 Star Rating system (voluntary basis)
	Energy Conservation Building Code (ECBC) (voluntary)
2009	Bachat Lamp Yojana – promoting CLFs
2012	PAT (First compulsory scheme)

After BEE was constituted in 2002 with the financial support from USAID, its first intervention program was the labelling program for EE appliances. It began by introducing voluntary energy-performance labels on appliances, which provided information about the relative performance of appliances in the market for consumers and manufacturers. This was followed by the introduction of standards that raised the minimum performance for these appliances. The next step was the Super Efficient

Equipment Program (SEEP), which aimed to make available in the market place household appliances with greatly enhanced efficiency.

Genia and Harrison (2012) argued that the reason for BEE to start with a national EE labeling program was in response to the challenges for a small organization with limited resources to ensure its message was heard - boosting the profile of the organization as the first step. Introducing an EE labeling program for electrical consumer goods in 2006 was considered to be one of the most visible information strategies by BEE. They found that, although little solid evidence could show the program's effect on actual consumer behavior, the scheme indeed helped to boost BEE's profile. Demonstrating BEE's ability to formulate policies and then ensure the effective implementation through the labeling scheme also helped to build the organization's credibility within the policy sphere. They stressed that the incremental approach of EE policy development was BEE's "creative maneuver" facing the weak state capacity and high organizational constraints.

Chaudhary et al. (2012) echoed this argument by proposing a framework of innovation stages. They argued that innovation systems are characterized by a set of actors with inter-relationships embedded in an institutional context that all together determine the performance of the system. In developing countries like India, all of the three elements - actors, their inter-relationships, and institutions – were argued to be generally weaker than in OECD countries. Limited in human and financial resources, with capabilities of various actors (firms, academia, government agencies, etc.) often weak, institutions constrain the scale and scope of innovation activities. In addition, the sustainability-oriented innovation development requires sufficient and continuous

investment, which the normal market mechanism cannot deliver. Even in the OECD countries, this market failure is a challenge. The problem is further exacerbated by weak innovation capabilities in the developing world like India. Therefore, given the enormous range of potential areas of EE intervention, the first step should be identification and prioritization of areas that offer the highest impact. And the labeling program fitted well with this strategy.

Both the “creative maneuver” and the “innovation stage” theories suggested a gradual pattern of India’s EE policy development during the second critical juncture. These theories analyzed the influence of organizational constraints, institutional weakness, and resource limitations as rationales for the gradualist approach to develop in contemporary India. Kostka and Harrison (2012) find that the BEE’s limited manpower and the lack of dedicated regional agencies made it align with the regional branches of the Solar Energy Corporation of India (a GoI Enterprise) and used the existing formal and informal networks of solar power to implement EE agendas. Meanwhile, Chaudhary et al. (2012) argued that the resource restrictions and the strategic planning were crucial to understand EE’s policy planning, especially the policy sequences.

To dissect these two theories using the harmony-conflict paradigm, the “innovation stage” theory underlies the rational choice of an EE policy sequence that was based on innovation development stages, while the “creative manoeuvre” theory also stresses the rationality of maneuvers by BEE under certain organizational constraints. Although both theories require the analysis of the conflict between limited human and financial resources of EE organizations and policy developments, neither has paid

enough attention to the politics in which the policy process is embedded. With this critique, we turn to the next step of the analysis.

5.4.2 Institutional embeddedness: a comparison with China

To push the discussion one step further, a comparison with China's distinctively different EE policy development suggests that other factors: i) the influence of path-dependent EE institutions, ii) the nature of the host governance structure, and iii) the specific political and economic context also played important roles in shaping EE policy patterns in India.

First of all, China's EE governance is closely attached to its economic governance structure at every level from the national, sub-national to micro governmental organizations. In that way, the EE policy agenda gained advantage from being embodied with, and implemented within, the broader economic development agenda. Further, China's economic governance agenda gained a reputation for effective delivery of economic growth, especially for its outstanding target-driven performance. EE policies in that sense took advantage of the effective economic governance structure, in order successfully to achieve their ambitious EE targets. While in India, EE's host organization – energy governance, in particular the MoP itself – was far less effective in terms of delivering its policy targets (universal energy access/electrification). The stagnating power reform was a typical example. Being embedded under such a governance structure in the first place, EE in India was not equipped with a potential for dramatic policy changes as could happen in China.

Second, China's EE development originated in a series of severe economic disorders after the Cultural Revolution. Therefore, ever since the initial development stages, EE

in China took a drastic approach to curb the energy shortage. The first critical juncture consolidated this drastic and target-focused approach inside Chinese EE institutions. In India too, the initial triggering crisis – oil insecurity – was seriously damaging to the economy. But, this was an acute crisis, which was moderated due to the normalization of the international oil prices following the resolution of the Iran hostage crisis that had triggered the second oil price hike. In addition, the triggering crisis was focused on petroleum, one form of commercial energy that was primarily used in industrial and commercial areas. This oil-focused driving force made Indian propaganda in favor of an all-society EE/EC movement as happened in China lack a foundation for political mobilization. Accordingly, unlike China, India's EE institutions, formed from the first critical juncture, did not prepare for future development to take a non-incrementalist and whole-society approach.

Third, compared with the Chinese political environment the Indian polity that has been accustomed to incremental reforms was much less accommodating to the idea of drastic policy changes. When China announced its 20% energy intensity reduction target for the 11th FYP right after the period of rising energy intensity (2000-2005), the whole country adjusted to the new target trajectory, though with strong reluctance from local governments, within the span of a few years. Despite the various maneuvers and manipulations during the implementation process, the political signal was strong enough to motivate cadres and enterprises to be dedicated to an EE movement. Such a political environment does not exist in contemporary India. In addition, in the case of China, the central governments still held control over the political appointments of local governments, so that the ECTRS could function; while in the federalist India, the growing power of states versus the weakening central

government over the 2000s, did not allow the GoI to pursue an overall EE scheme across the country like China.

In summary, EE policy development in India during the second critical juncture took a gradual and incremental approach that started from raising awareness, branding, standard setting, capacity building, and slowly moved to scaling up and launching compulsory targets for certain industries. It is distinctly different from China's drastic target focused approach. A comparison with China shows that all of the institutional, organizational, political and economic contexts collectively contributed to the development of India's EE policies.

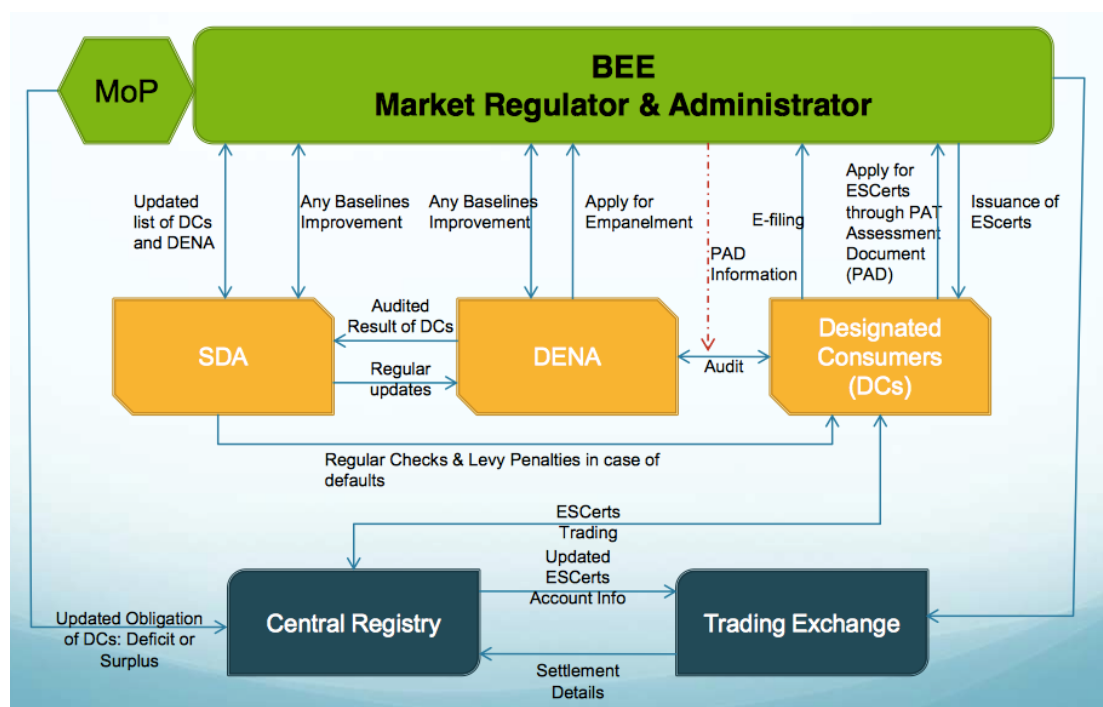
5.5 Institutionalization: reinforcing the market centrism

The last stage of my five-phase institutionalization framework is the legitimization, stabilization and reproduction of the institutions that formed from the previous stages. In India, due to the gradualist characteristics of EE policies, the institutionalization process is still ongoing. The institutions-in-information are being tested within the rapidly changing political, social and economic environments of contemporary India. This section responds to the last question of the analytical framework: what EE/LCD institutions are formed in India's second critical juncture? And, how are the institutions being stabilized under the preconditions of political economy?

As discussed in the previous sessions, India's second critical juncture reinforced the market-centered institutions that emerged from the first critical juncture. The market centered institutions saw EE as a great market opportunity that could count for 2% of GDP in the coming years. During this period, BEE, the nodal central government

agency for EE defined itself as a pure “Market Regulator and Administrator” (Fig. 5.14) that only deals with market failures.¹²² After the complicated and manifold interactions of the contextualization, conceptualization, organizational and policy development, this market-centrism is being reinforced, by the newly elected Modi government.

Figure 5.14 BEE’s self-defined “institutional design schematic”



Source: P. 12 in BEE (2011), available at IEA website http://www.iea.org/media/workshops/2011/emak-november/1.abhashukla_bee.pdf [last assessed 21 June 2015].

The Modi government came into power in 2014 with a promise of delivering economic growth and providing power to around 300 million Indians who still lack daily access to power. Universal energy access and electrification remain the top priorities of India’s energy governance. Apart from that, providing employment is another major component of Modi’s election platform. How to combine all these

¹²²Interview with Dr. Ajay Mathur, April 2014, New Delhi.

election promises into policy practice underpins the logic of current energy and economic governance.

Indeed, in order to keep EE's relevance with the growth-at-any-cost ideology in contemporary India, the EE policy cohort has been trying very hard to advertise EE as the new hot spot of economic growth. India self-promoted PAT as the first national market-based EE trading scheme in the world (Bloomberg, 2015). BEE has kept on emphasizing this rhetoric in order to fit EE policies into the growth-related trajectories of policy schemes. Meanwhile, EE has to "sell" itself to yet another policy priority – job creation. However, in terms of job creation within the holistic LCD package, EE was by no means competitive compared to renewable energy. With Modi promising to raise India's 2022 solar capacity five times the previous goal to 100 gigawatts in 2015, solar development has attracted most of the attention in LCD policy arenas.¹²³ EE again struggles to find its relevance to the growth agenda, and its comparative advantage within the job-creation mission.

The institutionalization process of India's EE showed two characteristics: on the one hand, the second critical juncture witnessed a reinforcement of the market-centrism that emerged from the first critical juncture; on the other, EE organizations keep up the struggle for their relevance and competence within the ever more fragmented and complicated energy governance structure. It is moving towards more market-based institutions/organizations with a path-dependent logic of survival. Modi's economic growth and job creation regime further imprints the controversial relationship between

¹²³ See *Down to Earth* report on 18 June 2015: <http://www.downtoearth.org.in/news/modi-government-sets-revised-solar-mission-target-at-100-gw-50236> [01 Aug 2015 last assessed].

EE, the energy security regime and the economic growth regime onto India's EE development.

5.6 Conclusion

This chapter maps out the five phases of EE institutional change process during India's second critical juncture starting from 2008. With a comparison with China, the chapter pinpoints India's survival-driven EE organizations, the gradualist approach of EE policy development, and the market-centric EE institutions that were interconnected during this round of institutionalization.

Current research tends to attribute the difference between China's decisive EE policy change and India's gradualism to the greater political accountability and economic capacity of the Chinese government as compared with the GoI. My analysis shows that, apart from this observation, the reinforcing mechanism between the key institutional players and the political economic context of contemporary India are also preconditions to make sense of the distinct EE development pathways of China and India. In particular, the bundling structure between the EE regime and the different host governance structure in China (economic governance) and India (energy governance) is the key nexus to make sense of the differences resulting from the Chinese and the Indian cases.

Before concluding a systematic comparison of China and India's EE and LCD institutional change process, the last two chapters of the empirical section of this project will discuss the role of policy process in EE institutionalization through the case of China's rural EE policy – to which we now turn.

CHAPTER 6: CASE STUDY BACKGROUND

So far I have laid out the macro level analysis of the EE institutionalization process from the 1970s to the present in India and China. Following that, the next two chapters will focus on a specific EE policy scheme – rural energy efficiency in China. The purpose of this case study is to vividly show, through the EE institutionalization process, the interacting dynamic between the state, local authorities, business, and villagers' everyday life. By focusing on a substantive EE policy scheme in the most recent conjuncture of EE development – rural EE in China – the case study intends to achieve two objectives: 1. To deepen understanding of how EE policies are structured by economic institutions in China, and 2. To make sense of how EE policies actively shape the institutionalization process of EE in a transition setting. This study, though with a focus on China, aims to map out the micro-mechanism of EE institutional development in fast growing economies.

China's fast economic growth since 1980s has been accompanied by a rapid rise in energy consumption and carbon emissions in its vast rural areas. In response to this considerable challenge, ever since the 11th Five Year Plan (FYP, 2006-2010), a series of policies has been launched to promote EE in rural China. Existing scholarship has touched upon the technological, financial, social and behavioral barriers to EE in rural areas. But little effort has been made to make sense of the policy process of rural EE, its relationship with economic institutions and the implications of policy success or failure. My case study is based on first-hand survey data collected over a span of seven years (2006-2013) in two villages of South China, coupled with extensive analysis of government documents. It focuses on the second critical juncture of China's EE regime that was structured by the increasing pressures from the ICCN,

domestic economic adjustment strategy as well as China's economic stimulus package facing the global financial crisis.

This chapter will lay down the conceptual and methodological foundation of the case study, while the following chapter will map out the analysis in detail. The first section justifies the case study approach in understanding the process of EE institutionalization in a transitional setting; the second section introduces the policy background of rural household energy efficiency, the case study of this thesis; the third section conceptualizes rural EE in China by critically analyzing related policy documents; In the final section, the details of my fieldwork methodology are laid out, preparing readers for the substantive analysis in the next chapter.

6.1 Justifying a case study in EE institutionalization

The in-depth case study is a commonly used method in social science. Yet it faces challenges in generalization, objectivity, and explicitness of the case study results. These challenges have been discussed in a definitive way (Flyvbjerg, 2006). For my thesis, the case study approach can be challenged for its small sample and limited scale in the face of broad and complex EE developments in different transitioning countries in general and China in particular. Yet methodological choices are not only a matter of “the best fit”, but also the evaluation of “the most practical” of the distinct characteristics of the problem one seeks to understand. To fulfill the aim of the thesis, the case study approach is both “the best fit” and “the most practical” in terms of exploring the multi-layered institutionalization process of EE in transitioning settings at the micro level. There are three reasons for this.

First, EE development itself involves a whole range of technologies, investments, policy schemes, governance structures, socio-economic settings and individual lifestyles. It is almost impossible to form a concrete and detailed understanding of this broad and complex issue solely relying on generalized and quantifiable analysis. Flyvbjerg (2006) argued that there are two kinds of human knowledge – context-dependent and rule-based, and that both approaches are needed for human learning. In EE development, a range of international organizations and research institutes since the 1970s have produced abundant rule-based knowledge. Such knowledge has been widely spread into, and further developed by, developing countries.¹²⁴ Compared to the systematic rule-based knowledge of the EE regime, context-dependent knowledge is seriously lacking in transitional countries like China and India. However, context-based knowledge is essential to make sense of a foreign concept/technology in local settings. The case study can remedy this scholarly gap because:

“[t]he closeness of the case study to a real-life situation and its multiple wealth of details is important ... for the development of a nuanced view of reality, including the view that human behavior cannot be meaningfully understood as simply the rule-governed acts found at the lowest levels of the learning process and in much theory.” (Flyvbjerg, 2006, p. 221)

Second, the interactions between various stakeholders in the EE institutionalization process in transitional settings require a nuanced understanding of the multiple path-dependence, of institutional change (if any), and of the complex causal relationships constituted through the changing technological, political, and socio-economic factors. The case study approach that pays much attention to processes as well as results can remedy the defaults of generalization. As Bennett and Elman (2006, p.259) eloquently elaborated the four advantages of the case study approach in studying the casual complexity of path-dependence:

¹²⁴ This part has been argued in the previous two chapters.

1. The case study offers a holistic and detailed analysis and helps elucidate how causal mechanisms operate in context;
2. Case study methods, and especially process tracing, are suited to explanations of rare events;
3. Case study methods, and especially process tracing, are suited to discover ‘left-out variables’;
4. Case study methods can help study interaction effects (if any) in the contingent period.

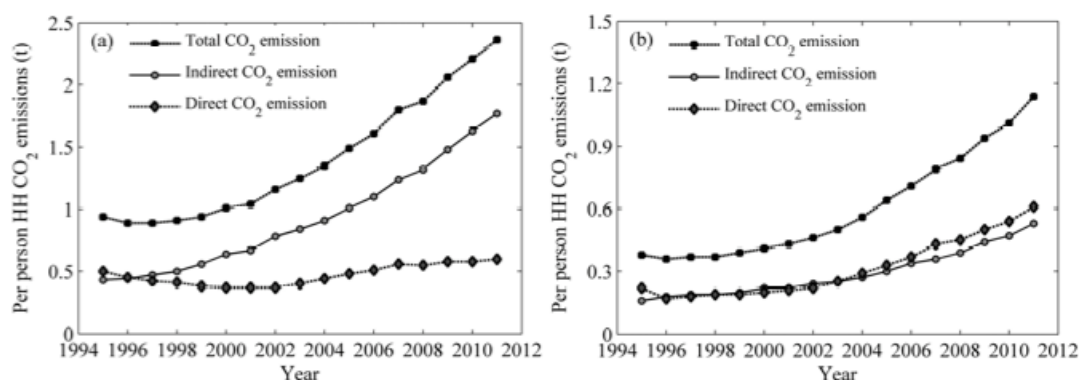
Third, regarding the limits of generalizing a case study result to broader theoretical levels, Stake (1995) argued: “[W]e do not study a case primarily to understand other cases. Our first obligation is to understand this one case...so the first criterion should be to maximize what we can learn.” (p.4) It means that a researcher using a case study method should not aim at generalization, rather, they should emphasize the interpretation of the case, and at the same time, seek to understand the particular field through this process. In my thesis, making sense of one EE policy through a case study in a transitional setting will contribute to the understanding of the micro-dynamic of EE development, which cannot possibly be covered in the macro-level analysis (Chapter 3, 4 & 5). It is also the most appropriate way to unpack the multi-layered political process considering the scope of the project and the capacity of the researcher. By doing this, the causal complexity of the institutionalization of EE in a large and complex society will be revealed. Then an EE policy case-study will form a base on which to link micro and macro level analysis, and relate both to theory (Walton, 1992, p.121).

6.2 Why rural EE in China?

Contrary to the commonplace understanding that urban areas and large-and-medium-sized commercial and social organizations are at the heart of the agenda for EE and LCD, I chose a rural area for my case study. According to China’s National

Development and Reform Commission (NDRC), nowadays, calculated based on the two modernization processes of China – the industrialization (mainly the industrial sectors) and the urbanization (mainly transportations and constructions) – about 70% of China’s carbon emissions come from the process of industrialization, and 30% from urbanization. By 2030, the ratio will become half-half. In the further projected, the urbanization process will contribute to more than 70% of China’s carbon emissions, while the contribution of industry will decline rapidly; and during this process, the major emitters will shift from large-scale and organized units (large point sources) to individuals, households, as well as unorganized and small-scale units (distributed sources), which is similar to OECD countries.¹²⁵ Rural China that is experiencing dramatic urbanization and substantial spatial transformations is therefore home to the largest potential of energy consumption and emission increase for the next two decades in China (Fig. 6.1).¹²⁶ Consequently, rural EE and low carbon development today is crucial to both domestic and international low carbon scenarios in the near future.

Figure 6.1 Per person household (HH) consumption emission (tCO₂/year) from urban (a) and rural (b) population in China (1994-2012)



Note: Fig. 1 in Qu et al. (2015).

¹²⁵ See a policy brief by Mr Chai Qimin, Vice Chairman of the Strategy & Planning Department, National Center for Climate Change Strategy and International Cooperation (NCSC): <http://opinion.caixin.com/2014-12-02/100757869.html> [last assessed 22 June 2015].

¹²⁶ Jiang Yi 2012 conference.

Furthermore, in attempt to understand the institutionalization processes of EE of transitional societies, rural China in the 21st century is an important case. It is experiencing unprecedented changes in every respect - demographic, economic, social and political – altogether forming a nexus of transforming complexity. Contrary to urban areas where inter-personal bonding and many traditional family values such as loyalty and responsibility to elders have been largely dissolved by modern lifestyles and power structure, rural China is stretched between societies with deep-rooted family values and the rapid modernization process. In this distinct characteristic of transitional societies both lifestyles and energy consumption patterns in rural China are rapidly changing. Both are as crucial in realizing EE as is the functioning of the EE policy regime at the grassroots level. Rural China therefore provides an example with which to examine the details of the EE policy process, the effectiveness of EE policies, as well as the broader institutionalization process.

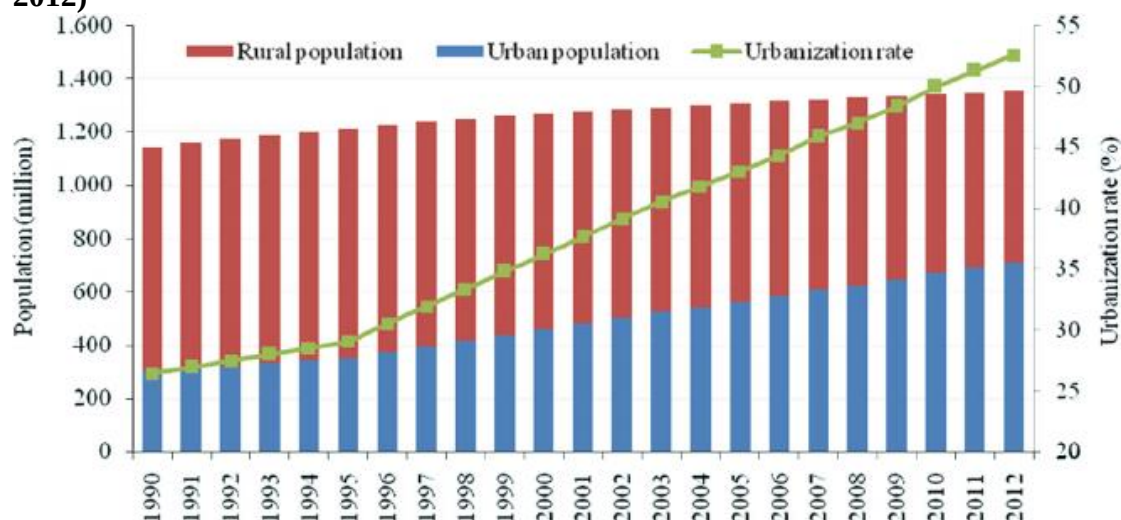
6.2.1 Changing demography and rising household energy consumption

China is home to the second largest rural population in the world, numbering 674.15 million, only slightly behind India.¹²⁷ The first decade of the 21st century has witnessed a fast decline in the rural population of China, from 64% of the total population in 2000, to 49% in 2011 (Fig 6.2). In the same year, China's urban population (690 million), for the first time in history, surpassed its rural population. The demographic change has caused in-depth family and social structure shift in many senses. According to China's sixth census in 2010, more than 61 million

¹²⁷ World Bank data 2013.

children are left-behind in rural area due to parents' labor migration. This accounted for 37.7% of all rural children and 21.88% of all children in China.

Figure 6.2 Urban and rural population and urbanization rate in China (1990-2012)



Note: Fig. 4 from Zhou et al. (2015); data based on the National Bureau of Statistics.

However, unlike the population and size of household, rural household energy consumption has actually increased, and done so even more rapidly. In 2000, commercial household energy consumption which is constituted by coal, electricity and oil in rural China was only 43.31 million tce,¹²⁸ but by 2011 this figure had nearly quadrupled, reaching 151.68 million tce. Of this, coal was the major component (An et al., 2014). The total volume of commercial household energy consumption in rural China has reached one third of its urban areas, and is increasing rapidly: above 10% annually.¹²⁹ The persistently climbing reliance on coal and the growing total energy consumption make the rural household a significant source of carbon emissions.

¹²⁸ Metric Tons of Coal Equivalent, see EIA website: <http://www.eia.gov/cfapps/ipdbproject/docs/unitswithpetro.cfm> [last assessed 22 June 2015].

¹²⁹ Conference report by Tsinghua University's Center of Building Energy Efficiency and Rural Research Institute: http://www.tsinghua.edu.cn/publish/news/4207/2012/20120328141559734672642/20120328141559734672642_.html [last assessed 22 June 2015].

Promoting EE in rural households has to be an important step to the overall EE and low carbon development strategy of China (Yang et al., 2010). In addition, the rising commercial energy prices combined with the declining proportion of biomass led to 78% of rural residents to consider energy consumption as a “heavy burden”.¹³⁰ Realizing EE in rural area is therefore core to villagers’ welfare.

6.2.2 Economic improvement and “Building a New Socialist Countryside”

The rise in household energy consumption is a reflection of growing household income, the improving quality of life, and changing lifestyles of rural China in the 21st century. Per capita income in rural areas increased from 2,253 RMB in 2000 to 6,977 RMB in 2011, more than tripling; and per capita living space went up from 24.8 m² in 2000 to 36.2 m²; an increase of 46%.¹³¹ This rapid change is partly attributed to the expanding economy that employed more than 250 million rural migrant workers (Nongmingong 农民工)¹³², whose income, remitted home, has greatly contributed to the growth of rural household incomes.

Yet the rural-urban gap was still progressively widening (Fig. 6.3). Aware of the increasing social instability and political pressures caused by the disparity, the problems of agriculture, the countryside and farmers’ welfare (San’*nong* 三农) became urgent tasks for the government. An overall enhancement of rural development policies was launched under the 11th FYP. In planning the rural development strategy for the 11th FYP, the Central Committee of the Communist

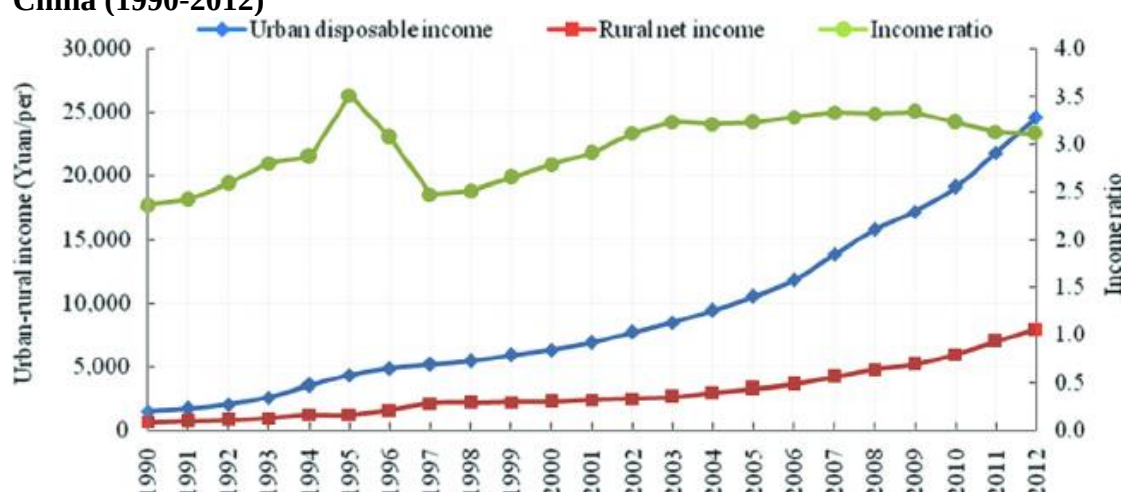
¹³⁰ Ibid

¹³¹ National Bureau of Statistics.

¹³² Ibid. In 2013, 268.94 million migrant workers were reported, see: http://www.stats.gov.cn/tjsj/zxfb/201405/t20140512_551585.html [last assessed 22 June 2015].

Party, China's highest political body, announced an ambitious rural policy framework – “Building a New Socialist Countryside” (He, 2007). On Jan 1st, 2006, the starting year of the 11th FYP, the Chinese government abolished agricultural taxes¹³³ - a levy of “royal grain” that the Chinese peasants had been obliged to pay over the past 2,600 years of history. Following this milestone, a huge amount of government funds have been dedicated to all kinds of rural development projects under the program of “Building a New Socialist Countryside” (Ahlers and Schubert, 2009). And EE gradually became an important element under this extensive publicly-funded rural development program.

Figure 6.3 Annual per capita disposable income of urban and rural household in China (1990-2012)



Note: Fig. 2 from Zhou et al. (2015); calculated based on the National Bureau of Statistics data.

6.2.3 Landscape changing and governance transforming

In the first decade of the 21st century, China reached a rate of urbanization never before seen in human history. Its urbanization rate increased by 11.3%, and its urban

¹³³ Chinese government website. See: <http://www.china.org.cn/english/2005/Dec/153739.htm> [last assessed 22 June 2015].

population was boosted by 170 million.¹³⁴ Promoting EE in a fast changing landscape like contemporary rural China is unique in the history of EE development, presenting both opportunities, and serious challenges.

The unprecedentedly rapid demographic, economic and spatial changes contribute to the transformation of the village governance structure. After the abolition of the agricultural tax, the village cadres became much less useful to both the peasants and the Party-state, because previously, collecting the agricultural tax was their major job (Chen, 2014). This structural change has been coupled with the rapid penetration of markets in rural areas, signaled by the consumption stimulus scheme as well as the program of Building a New Socialist Countryside. Local governance had to adapt those changes and transformed the way it functions. This adds to yet another layer of transitional complexity of EE regime in rural China.

To conclude, rural China from 2006 to the present provides a distinctive field for studying EE development in a transitional setting. Choosing rural EE in China as case study is a strategy of the “extreme case” in Flyvbjerg (2006) that aims at “obtain(ing) information on unusual cases, which can be especially problematic or especially good in a more closely defined sense”, because “[E]xtreme cases often reveal more information because they activate more actors and more basic mechanisms in the situation studies” (p. 230). Chinese rural EE is an “extreme case” because of the rapidity of change. Making sense of the EE development in a fast changing economy and society, such as rural China, will allow us to maximize on knowledge of the

¹³⁴ Ibid. See: <http://politics.people.com.cn/GB/1026/14353309.html> [last assessed 22 June 2015].

potential consequences and the institutionalization process, which may be relevant to other transitional settings.

6.3 Establishing Energy Efficiency in rural China

Rural EE in China is a politically conceptualized policy realm that embodies not only one, but multiple political, economic and development agendas. From the beginning, the concept of “rural EE” is mixed with several overlapping and problematic realms such as rural energy development, renewable energy and sustainable agriculture. As early as 1997, rural energy development was written into China’s first ever Energy Conservation Law. Yet its focus was on energy development rather than energy conservation/efficiency:

Article 38 under Chapter 4 “Technological Advances in Energy Conservation” states: The people's governments at all levels shall, under the principles of doing what is appropriate in light of local conditions, complementing multiple forms of energy, making synthetic use of energy and laying stress on results, enhance energy development, promote methane, solar, wind, hydro, geothermal and other new and renewable energies in rural areas. (各级人民政府应当按照因地制宜、多能互补、综合利用、讲求效益的方针，加强农村能源建设，开发、利用沼气、太阳能、风能、水能、地热等可再生能源和新能源。)

The definitive scope of rural EC/EE in the 1997 Energy Conservation Law did not mention anything that falls under the conventional and international definition of EE – to produce more output by the same energy input. Rather, it is a reflection of rural energy shortage during the 1990s. Enhancing energy supply from various sources, including renewables was the priority for rural energy agenda.

Entering the 21st century, EE/EC became more salient in the political agenda. In 2006, the first year of the 11th FYP, rural EE was identified as one of the six ‘key areas of energy conservation’ that included industries, buildings, transportation, government

agencies, commercial and civilian energy consumptions in the Decision of the State Council on Strengthening the Energy Conservation Work (Guofa [2006] No.28, August 2006) (国务院关于加强节能工作的决定). A year after the Decision, in 2007, the amended Energy Conservation Law was passed by the National Congress. Here, rural EE was addressed in a more comprehensive and detailed way compared to the first Energy Conservation Law a decade earlier:

Article 59 under Chapter 4 “Technological Advances in Energy Conservation” states: The people's governments at or above the county level shall, under the principles of doing what is appropriate in light of local conditions, complementing multiple forms of energy, making synthetic use of energy and laying stress on results, enhance energy conservation in agriculture and in the rural areas, and increase their input of funds to spread the application of energy-saving technologies and the use of energy-saving products in agriculture and in the rural areas. (县级以上各级人民政府应当按照因地制宜、多能互补、综合利用、讲求效益的原则, 加强农业和农村节能工作, 增加对农业和农村节能技术、节能产品推广应用的资金投入。)

The relevant departments in charge of agriculture, science and technology, etc. shall support and spread the application of energy-saving technologies and the use of energy-saving products in agricultural production and in agricultural product processing, storage, transportation, etc., and encourage the replacement and elimination of agricultural machines and fishing vessels that consume excessive quantities of energy. (农业、科技等有关主管部门应当支持、推广在农业生产、农产品加工储运等方面应用节能技术和节能产品, 鼓励更新和淘汰高耗能的农业机械和渔业船舶。)□

The State encourages and supports the rural areas in their great effort to develop methane, spread the application of the technologies for utilization of such renewable sources of energy as biomass energy, solar energy and wind-power and, under the principle of scientific planning and exploitation in an orderly manner, to develop small-scale hydro-power generation, popularize energy-saving rural housing and cooking range, and it encourages the growth of bioenergy crops by making use of non-arable land and the extensive development of fuel forest and other forests used for energy. (国家鼓励、支持在农村大力发展沼气, 推广生物质能、太阳能和风能等可再生能源利用技术, 按照科学规划、有序开发的原则发展小型水力发电, 推广节能型的农村住宅和炉灶等, 鼓励利用非耕地种植能源植物, 大力发展薪炭林等能源林。)

Apart from stressing the government financial and policy support towards rural EE, the most significant development of the new Law on rural EE was the enlarged scope and more sophisticated content of rural EE, which set the tone for rural EE development in China in the 21st century. Compared with the international understanding of EE, especially rural EE, the scope of the Chinese project is uniquely broad, covering nearly all areas of agricultural and rural household energy-related activities. It even includes developing new and renewable energy sources, which is usually considered as a separate field from EE/EC.

The scope and scale of rural EE planning has been growing since the 11th FYP. In the 12th FYP, rural EE has been expanded into an even larger and more comprehensive framework. In the 12th FYP, rural EE added solid and liquid waste management, which is called the “Village Cleaning Project” (农村清洁工程), pollution management of agriculture and aquaculture through the promotion of ecological, recycled and sustainable technologies (积极防治农业面源污染), and energy conservation and efficiency in county and village enterprises (推进乡镇企业节能).¹³⁵ Since the 11th FYP, the concept of rural EE in China evolved from a focused concept of energy enhancement in rural areas in the first Energy Conservation Law, into a holistic program that covers every corner of rural living and production activities – exceeding the original boundary of EE that was set by international technological standards.

¹³⁵ Department of Agriculture Ordinance on Further Strengthen Energy Conservation and Emission Reduction Work in Agricultural and Rural Areas (Nongkefa [2011] No.12) (农业部关于进一步加强农业和农村节能减排工作的意见).

Rural EE then distinguished itself from the commonly-used term of “EE” in rural areas, and became a problematically complex policy concept in contemporary China. It is not a concept that merely emerged from everyday life and technological advance of energy development and environmental concerns. Rather, it is a policy concept that is the logical and political extension of multiple broader political agendas. From 1997 to 2007, along with the wider institutional change in EE (see Chapter 4 here), rural EE became the intersecting field of two momentous national political agendas that were simultaneously promoted by the Chinese government during the 11th FYP: “Building a New Socialist Countryside” (新农村建设 rural development) and “Energy Conservation and Emission Reduction” (节能减排 energy efficiency). As the then Minister of Agriculture, Mr. Sun Zhengcai wrote on People’s Daily in July 2007, three month before the amended Energy Conservation Law was passed by the National Congress:¹³⁶

Energy Conservation and Emission Reduction (ECER) is a critical strategy of the Party Central and the State Council. It is essential to transform the economic development model and to realize social and economic development in a better and faster way... Doing a solid job on rural EE is of crucial importance to promoting development in agriculture and rural economy as well as realizing the national ECER target. (节能减排, 是党中央、国务院作出的重大战略部署, 是转变经济发展方式、实现经济社会又好又快发展的必由之路... 扎实做好农业和农村节能减排工作, 对于促进农业和农村经济发展、实现国家节能减排目标具有重要意义。)

In this key policy document, rural EE was conceptualized by the Minister of Agriculture as a vehicle to serve the national goals of “rural development” and “energy efficiency” together. Having argued in the previous chapter, the ECER strategy in the 11th FYP was designed as a nexus of multiple political and economic

¹³⁶ People’s Daily is the most influential official newspaper in China. A policy article written by ministerial leaders published on People’s Daily is a strong and clear signal of support and implementation of a forthcoming or on-going policy. This article is assessed through: <http://theory.people.com.cn/GB/49154/49369/6010858.html> [last assessed 22 June 2015].

agendas: structural adjustment of the economy, responses to international climate change pressures as well as energy efficiency. Rural EE in this way embodied all of those political, economic and social programs. The invention of the “rural EE” concept in the context of the 11th FYP onwards has been politicized from the very outset. Its development is intimately shaped by the EE institutions that were experiencing the joint conjuncture of the commercialization and globalization process in the Chinese economy (see Chapter 4).

At the same time, the newly-minted concept of “rural EE” created a brand new field for vast public funding, especially during the 4 trillion (RMB) stimulus package following the international financial crisis (which will be unpacked in Chapter 7). In the previous section we introduced the “Building a New Socialist Countryside” flagship policy and investment scheme started in 2006 comprehensively revitalizing rural development. Under this framework, EE was an important constituent. Resources in terms of finance, research, propaganda and education have been mobilized around EE for the first time in Chinese history.

6.3.1 Rural household EE and everyday life

Guided by Article 59 of the Energy Conservation Law, the 11th and 12th FYP and related policies issued mainly by Ministry of Agriculture and Ministry of Housing and Rural-Urban Development, household EE, among all the rural EE policies, has attracted most of the political and financial attention. According to the Annual Review of Low-Carbon Development in China (2014), in 2011 alone China invested a total of 400 billion RMB (64.4 billion USD) in EE, the highest sum in the world. Of this, the government contributed 17.1% (68 billion RMB, equivalent to 11 billion

USD). Remarkably, one single policy program, aimed at promoting EE home appliance use in rural China – “Household Electrical Appliance Going to the Countryside” (Jia Dian Xia Xiang 家电下乡), made up more than a quarter (32.6 billion RMB) of the total government fiscal fund of EE for both rural and urban areas in 2011.

With intensive political and economic resources dedicated to rural EE, especially household EE, the politically constructed policy concept of “rural EE” encountered mass rural demand. To make rural EE work across vast rural areas, the logics of politics (provided by the state), economics (provided by the market) and technology (provided by technologists) have to mesh with the logic of 700 million villagers’ everyday life. In fact, the success of linking these distinct logics is crucial in achieving the original twin policy agendas behind rural EE – rural development and energy efficiency. Later on, the international financial crisis made the political agenda paramount – defending economic growth – that made the landscape of EE, especially rural EE even more complicated. Household EE in rural China therefore became a nexus of the state, market, technology and villagers’ everyday life.

Yet this important issue has not been effectively addressed by scholarship in context of contemporary China. Existing rural EE literatures mainly focus on broader issues, such as quantitative analyses of energy and EE scenarios (Pan, Yang et al., 2010, Zhang et al., 2009, He et al., 2014), standard and metrics of rural EE development (Wang and Feng, 2002, He et al., 2014), qualitative studies of energy and EE policy development targeting rural areas (Zheng et al., 2013), or specific EE and renewable technologies (Liu et al., 2008, Chen et al., 2010, Zeng et al., 2007). Geo-, socio- and

economic impact on rural energy consumption patterns (Wang and Feng, 2001, Zhou et al., 2008, Chen et al., 2006, Jiang and O'Neill, 2004), and financial barriers to rural EE and renewable energy development (Huang, 2009) have also been investigated.¹³⁷

Consequently, several crucial questions have not been effectively addressed: 1. How have policies achieved (or not achieved) the goal of promoting rural household EE, rural development and energy efficiency? 2. What are the implications of such extensive government EE funds to villagers' real life? 3. What is the relationship between the policy process and actual results of major subsidy programs toward EE in rural China? And 4. How did EE become integrated or clash with different areas of rural governance, and with what effects? Answering those questions offers a unique opportunity to make sense of the roles of several crucial components in the EE institutionalization process since 2006¹³⁸ - EE regime, policies and villagers' everyday life. It helps to analyze a politically-constructed policy concept – rural EE in this case – taking root in a transitional and complex society, under the background of the international financial crisis. In addition, it also helps to understand the creation of rural EE as a particular policy area that shaped the institutionalization of EE. In this way, the case study of China's rural household EE will contribute a fresh perspective that is both grassroots and global to the understanding of EE institutionalization process in transitional settings.

6.3.2 Conceptual and terminological clarification

¹³⁷ Rural Energy and Energy Efficiency is a rich and emerging scholarship in both Chinese and English languages. It is beyond the paper's scope to include all of it. The cited studies are only some of the representatives that are available in English.

¹³⁸ Refer to Chapter 4 for the conjuncture.

As elaborated in this section, EE in rural China is a much broader and more complex concept than the international standards of EE. This difference in definition generated analytical ambiguity. For the context-based analysis, I employ the concept of EE in the specific context of China since the 11th FYP. That is to say, without further explanation, “rural EE” in this case study refers to the constructed policy concept that covers all rural EE aspects mentioned in related Chinese policy documents, mainly the Energy Conservation Law (2007), the 11th and 12th FYP and several policies issued by the Ministry of Agriculture and the Ministry of Housing and Urban-Rural Development. It differs from the internationally acknowledged neutral technological term of EE.

6.4 Fieldwork

In this section, I will give a brief historical review of this case study over a seven year time-span, and then discuss details of the field site and methodology,

6.4.1 National Rural Household Energy Survey 2006-2007

In 2006, when the first year of China’s 11th FYP, the Agricultural Tax was abolished and Building a New Socialist Countryside program was announced, I was a freshman in the Department of Building Technology at Tsinghua University. The Dean of my department, Professor Jiang Yi and several other faculty members were leading a large-scale rural energy and environment survey in northern China. The project was mainly funded by the Ministry of Agriculture as part of implementing the broader political agenda of rural development and energy efficiency. The Tsinghua research team designed a Guide Book of Rural Energy Survey in North China (北方农村能源调查指导书), and employed 350 students from all disciplines across the university to

conduct household energy survey during the summer holiday of 2006. This survey covered rural areas in 88 counties of 15 provinces in northern China, including Beijing, Tianjin, Henan, Hebei, Shandong, Shaanxi, Shanxi, Heilongjiang, Jilin, Liaoning, Inner Mongolia, Gansu, Ningxia, Qinghai and Xinjiang.

The project mainly employed experienced research students for the fieldwork. Being freshmen, my classmates and I were not invited to join. At the same time, all of the undergraduate students at Tsinghua University were required to conduct short-term collective research during the summer holidays. Tsinghua University calls it the “Summer Holiday Social Practice Program” (暑期社会实践). Students are encouraged to form their own teams around the topics interesting them, and find a faculty member to be the supervisor. Five classmates and I who were interested in rural energy issues formed a small research team and then approached Professor Zhao Bin, the director of our class, to be the supervisor. Professor Zhao suggested that, although we could not be part of the large project on northern China’s rural energy survey this year, we could do some pioneering research in southern China.

From Professor Zhao we learned that the national rural energy survey started in northern China because heating in winter was considered to be the major part of rural household energy consumption, and winter in northern China usually lasted longer and the temperature was lower than the southern region. But the humid winter climate in southern China still made indoor living extremely cold and uncomfortable. With economic growth, people aspired for better living conditions by using more air-conditioners and/or indoor heating technologies, which would lead to increase of rural energy consumption. In addition, summer in the south is hotter and more humid,

which generates substantial demand for energy when economic condition turns better. So rural EE was important as well.

Yet another neglected factor behind the North-South divide of the national rural household energy consumption survey was the Huai River policy. During the 1950-1980 period of central planning, the Chinese government established free central winter heating (Nuanqi 暖气) of homes and offices in urban areas via the provision of free coal for fuel boilers as a basic right. But because of budget limitations, this right was only extended to urban areas to the north of the Huai River and Qinling Mountain range. In the wake of the economic reforms, the central heating in northern cities was no longer free of charge, but even today the long-lived Huai River policy has made regular indoor heating in the north much more common than in the south (Chen et al., 2013). Even though the Huai River policy was mainly applied in urban areas, the logic of tackling urban household energy consumption was applied in the new policy practice for rural households, when rural household energy problem was for the first time addressed by the government in the 11th FYP.

This interesting phenomenon, from the practical policy perspective, showed that although the need to improve life quality through an intervention in household energy consumption was a real need, when the Ministry of Agriculture funded the national rural household energy survey in 2006, it was not clear about the actual rural household energy consumption situation. The result of the survey did not come out until 2012. Yet since 2007-2008, a huge amount of public funds were poured into the field of rural EE. It seemed that the theoretical policy process of need-research-

planning-implementation had been abruptly disrupted and directed in an unexpected way surrounding rural EE. This will be unpacked in the following chapter.

The national rural household energy consumption survey 2006-2007 however marks the starting point of China's rural EE research in the 21st century. And that is how my interest and work in this topic began.

Figure 6.4 North-South Divide - the Huai River and Qinling Mountain range

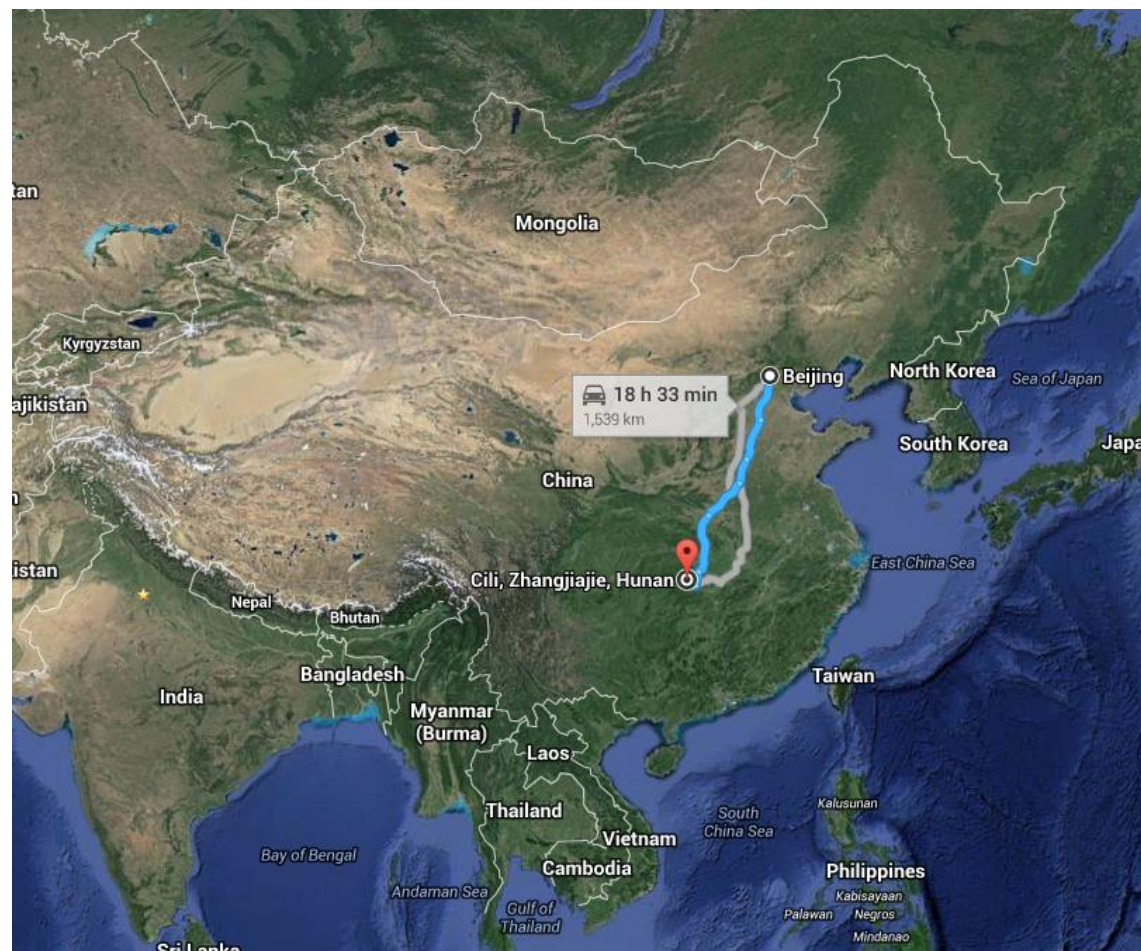


Source: Chen et al. (2013)

6.4.2 Encountering rural EE in Cili County of Hunan Province

Professor Zhao explained that the government would expand the survey into southern China soon, probably the following year. So it would be very useful if we could gather some preliminary data and observations to inform the forthcoming design of the large-scale survey in southern China. Under Professor Zhao's guidance and based on the Guide Book of Rural Energy Survey in North China, we designed a survey that is more suitable for rural areas in southern China. Then we faced the question of where to go for this summer research program. One of the team members, Ms. Jinghua Li's home is in Cili County of Hunan Province in south central of China. She had relatives who were still living in rural sites and willing to help. In the meanwhile, two more members from other departments joined the team, and I became the team leader. In July 2006, the team of 8 members of undergraduate students went to Cili County in Zhangjiajie Municipality of Hunan Province from Beijing by train.

Figure 6.5 Beijing to Cili



Note: Google Map assessed at 2 December 2014.

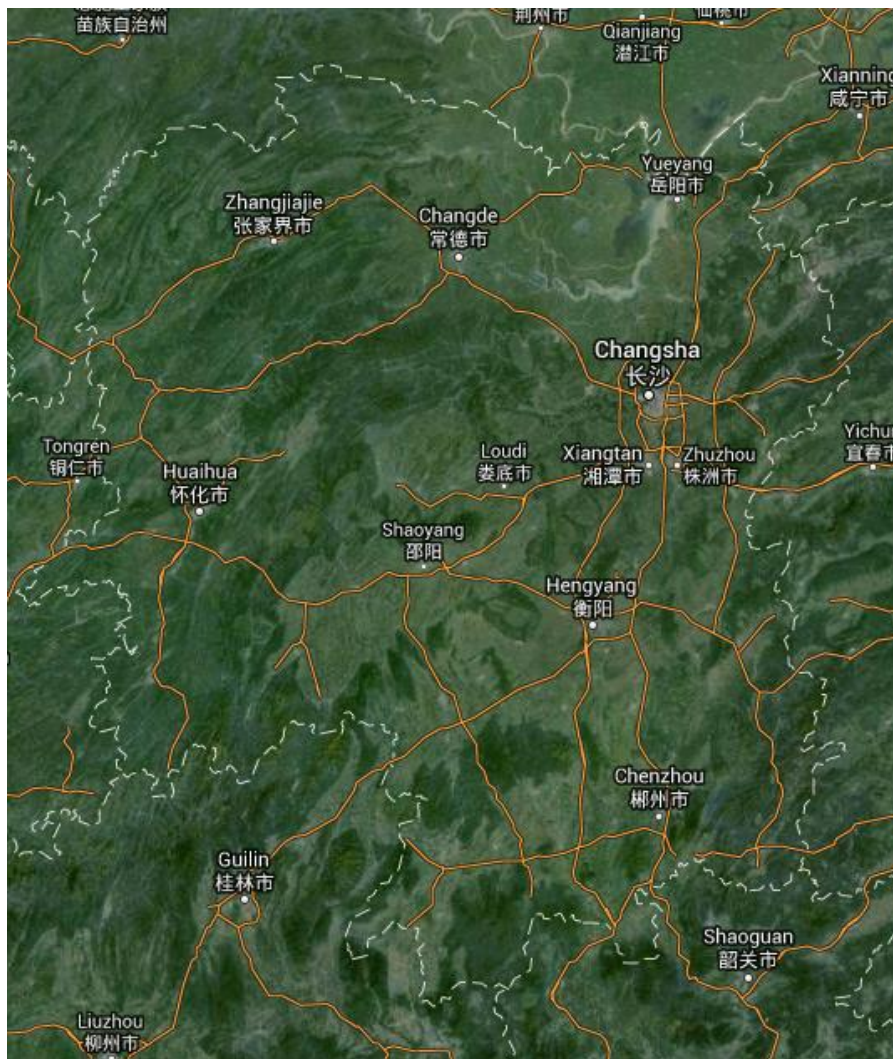
Hunan Province

Hunan province is located on the south bank of Yangtze River in south central China, and situated between $108^{\circ} 47'$ - $114^{\circ} 16'$ east longitude and $24^{\circ} 37'$ - $30^{\circ} 08'$ north latitude. It covers an area of 211,800 square kilometres (81,800 sq mi). The east, south and west sides of the province are surrounded by mountains and hills. The mountainous areas occupy more than 80% of the area and plains comprise less than 20% of the whole province.

Climate of Hunan is classified as being humid subtropical under the Köppen climate classification. Winter is short, cold and damp, with January temperatures average 3 to

8 °C (37 to 46 °F); Summer is very hot, rainy and humid, with July temperatures average around 27 to 30 °C (81 to 86 °F). Its average annual precipitation is 1,200 to 1,700 millimeters (47 to 67 in). In such a climate, the natural ambient comfort level in rural households remains very low. Effective interventions to indoor temperature and humidity are needed for better quality of life.

Figure 6.6 Hunan Province



Note: Google Map assessed at 2 December 2014.

Cili County

29°04'—29°41'N, 110°27'—111°20'E

Cili County is part of Zhangjiajie municipality, which is located in the northeast of Hunan. It has 245,000 households and a population of 701,000, around the average of

counties nationwide. It has an area of 3480 sq km, with 64% of mountain areas. Li river that runs through the country NE – SW forms the main river system. It is one of the 20 “National Poverty Counties” (Guojia Ji Pinkun Xian 国家级贫困县)¹³⁹ of Hunan province.

Figure 6.7 Cili in Hunan province, People's Republic of China



Note: Google Map assessed at 2 December 2014.

After we arrived in Cili County, we settled down in Jinhua’s home on the edge of the urban area of Cili municipality. Not far from the house was the Li River. In 2006, the Li River was the boundary of urban-rural divide. Across the river, it was Jiangjiaping Village, or commonly called Taiping Village. One of Jinhua’s relatives, Wang

¹³⁹ “National Poverty Counties” receive funding from national poverty alleviation programs annually. Starting in the 1980s, it was a policy scheme designed to identify the “most needed” for poverty alleviation. However, the involvement of corruption of the public fund has discredited the scheme and some of the selected counties may not be the poorest and the most needed anymore. See a series of reports issued by China’s National Audit Office (2013), and also see a ChinaFile piece on this topic available in English: <http://www.chinafile.com/multimedia/infographics/who-really-benefits-poverty-alleviation-china> [27 July 2015 last assessed].

Yuhuang was living in the village. Through this contact, we started the household survey with Taiping village.

Figure 6.8 The Li River - the urban-rural boundary of Cili County (facing Taiping village)



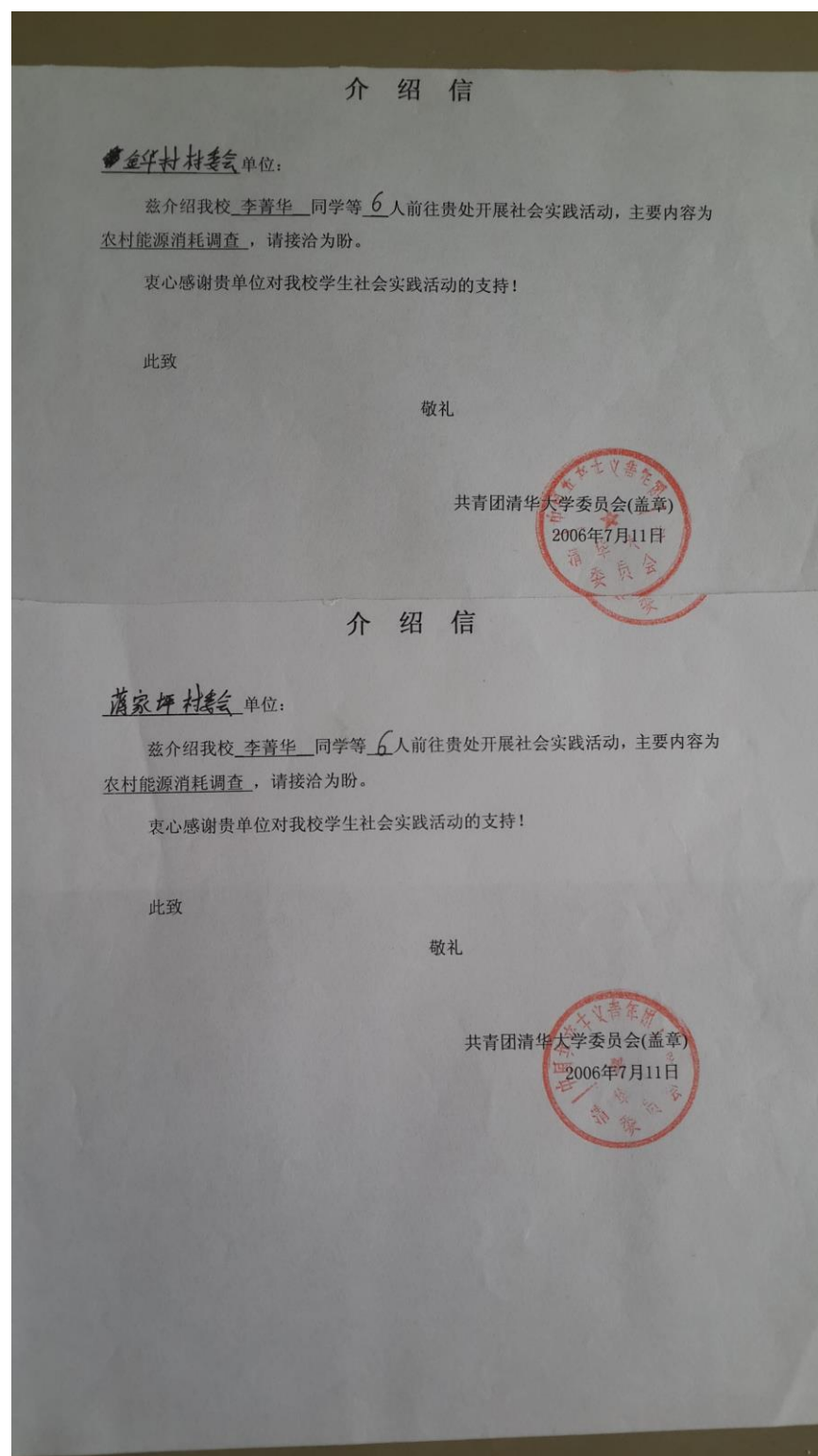
Note: Photo by the author.

Wang was the owner of a private sand mining company. He had a few sand mining boats on the Li River and earned profit from selling the sand mined from the river to local real estate developers. This business was developing rapidly. But Wang was the only one in the village who had the certificate to run such business, he was also a member of the village party committee. He easily helped us get in touch with the village party secretary Xing Xiexi. In the beginning, we interviewed the village party secretary and village accountant Yu about the overall socio-economic development of the village. When we told the party secretary that we were interested in researching the household energy consumption in his village and the villagers' attitude to EE, all

the local people seemed very confused. The party secretary directly asked: “What is EE (什么是节能)?” In the summer of 2006, the concept of “rural EE” was still being figured out by the central government, and the villages in Cili County did not have a clue about this impending policy and the upcoming EE movement in rural China.

We showed the party secretary our recommendation letter provided by Tsinghua University Youth League Committee of CPC to prove that we were there for the Summer Holiday Practice Program (Fig. 6.9). The party secretary was satisfied and allowed us to interview the villagers. But he said it was not possible to do many surveys: “Young people are in town for work. Only old people are left here. The elders are illiterate. They know little about EE.” When we said that it should not be a problem because we were confident to communicate with the elders, since Wang’s wife and our local team member’s sister had volunteered to guide us, the party secretary still insisted that we could interview only a few households without giving other reasons. He also asked us to start with his household.

Figure 6.9 Recommendation letter from Tsinghua University Youth League Committee of CPC for the summer program in 2006



Note: Photo by the author.

Local authorities' reluctance to approve unofficial household surveys is fairly common. Although we carried an approval from the party Youth League Committee from Tsinghua University, the then Chinese president's alma mater and probably the most academically distinguished as well as politically correct universities in mainland China, this official support was still too distant and vague to the village authorities. A call from the county government would be much more useful. The national rural household energy consumption survey that was being carried out in 15 provinces of northern China in the summer of 2006 was facilitated by the Ministry of Agriculture and its local branches at all levels of the governments. Without such strong institutional support, we could not require the same level of local facilitation in Taiping village. In addition, large-scale survey data was not the purpose of our program.

Apart from that, the party secretary insisted we start the survey with his household because he wanted to know "what on earth does 'rural EE' mean", and what we were trying to research. When we explained that "rural EE" essentially means Saving Energy Reducing Emission in rural areas, he seemed to understand this political slogan of EE a bit more, yet was still confused about the relationship between the political slogan/agenda and rural everyday life. We showed him the seven-page long survey questionnaire, and he concluded that it was about building structure and household energy consumption, which made more sense to him than the abstract "EE". We also faced tremendous problems in explaining the concept of EE to villagers during the interviews back in 2006. The concept was too foreign to villagers' living

experience.¹⁴⁰ It seemed to be a weird experience for both sides: the villagers were trying hard to understand a foreign concept that was suddenly brought by a group of undergraduate students from the elite university in the capital city, while we were trying hard to make sense of a yet-to-be-properly-defined policy concept through investigating the real household energy consumption patterns with the villagers. We had to translate EE into “better living quality” “cleaner environment” “warmer in winter and cooler in summer” – a usual practice in OECD countries of making EE “saleable” and “comprehensible” to the Chinese villagers, in order to make the communication less complicated.

After interviewing the party secretary, he said that we could find five or six households in the village for the interview because “that would be enough”. “Enough” had two meanings: first, the household situations were similar in the village so that 5-6 representative households would be enough for us to achieve the fieldwork goal; second, 5-6 household surveys were the maximum he would be willing to permit us to interview. He did not want any unexpected trouble from students.

We soon realized why. For example, after we interpreted EE as “better living” during the interviews, some villagers started to complain about their poor living conditions and/or problems they had long been troubled with, and even asked us to report the trouble to the central government after we went back to Beijing. For example, a female villager talked about her imprisoned son in a coastal province and asked us to help save his life. In many villagers’ minds, people who came from Beijing,

¹⁴⁰ Chapter 7 will elaborate in details why and how EE appeared to be a “foreign concept” to villagers, and the origins of the misconception of rural EE between the policy and rural everyday life.

especially from the elite university, could “have a word” (*shuoshanghua* 说上话) with someone in the central government that might help. But we were just undergraduate students and obviously could be of no help in such cases. Even if we insisted on the non-interventive and empathic attitude during interviews, the interviewees expected us to be interventive. Especially when the topic we were trying to research – rural EE – was irrelevant to the villagers’ main concerns, such as income, education and healthcare, quite often the villagers tended to lose the main point during the conversation and started to interpret survey questions into their own understanding. This process was anyway useful for us to understand the villagers’ attitude towards EE and potential opportunities of EE realization, so we made records of the conversations. Yet this thought-provoking process could make the village party secretary quite uncomfortable. That partly explained his limiting the number of households surveyed.

The village party secretary was the key gatekeeper for our entry into the field. Though we did not need his help in finding interviewees, his objection could give us trouble. The party secretary’s attitude towards us was cautious but not rejecting. All in all, we were just a group of students who would come and go in a couple of days, and we had recommendation from a well-known university’s party youth league. More importantly, we came with Wang, his colleague in the village party committee and a friend. He had no reason to intervene. Yet we actually had little room to negotiate with the local authority on the total number of households that we could conduct the interviews.

Figure 6.10 Showing Taiping Village party secretary the old recommendation letter from Tsinghua University Youth League Committee of CPC (2006) during the meeting in 2013



Note: Photo by Zhuoyu (local research assistant).

6.4.3 Selection of households

According to Flyvbjerg (2006), the strategic selection of samples can increase the generalizability of case studies. According to him, there are two kinds of strategies for sample selection, one is random selection, while the other is information-oriented selection. Given the fact that we could assess only 5-6 households in Taiping village (700 villagers in total), random samples were not only impossible but also inappropriate. Because the aim of the program in the beginning was not to construct general descriptions of rural EE in south China, but rather aimed at maximizing the very limited, if not zero knowledge about the status quo of rural household energy consumption and potential rural EE opportunities, the selection of the sample

households needed to be able to help “clarify deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur” (Flyvbjerg, 2006). So, the Information-oriented selection procedure that aims at maximizing the utility of information from small samples and single cases was used. Cases are selected on the basis of potentials of information content.

Table 6.1 Sample selection strategy

Strategies for the Selection of Samples and Cases	
Type of Selection	Purpose
A. Random selection	To avoid systematic biases in the sample. The sample’s size is decisive for generalization.
1. Random sample	To achieve a representative sample that allows for generalization for the entire population.
2. Stratified sample	To generalize for specially selected subgroups within the population.
B. Information-oriented selection	To maximize the utility of information from small samples and single cases. Cases are selected on the basis of expectations about their information content.
1. Extreme/deviant cases	To obtain information on unusual cases, which can be especially problematic or especially good in a more closely defined sense.
2. Maximum variation cases	To obtain information about the significance of various circumstances for case process and outcome (e.g., three to four cases that are very different on one dimension: size, form of organization, location, budget).
3. Critical cases	To achieve information that permits logical deductions of the type, “If this is (not) valid for this case, then it applies to all (no) cases.”
4. Paradigmatic cases	To develop a metaphor or establish a school for the domain that the case concerns.

Source: Table 1 in Flyvbjerg (2006)

In order to maximize the understanding of rural EE, it is important to take into consideration the different socio-economic status of households and their different attitudes towards EE. With the help from Wang’s wife from Taiping village and the Party Secretary Zhu’s wife from Jinhua village, we therefore employ the strategy of

“maximum variation cases” summarized in Flyvbjerg (2006), which can enable us to “obtain information about the significance of various circumstances for case process and outcome.” In this specific program, we applied the theory of social stratification in rural China in order to select the cases that can represent different socio-economic status in a village.

6.4.4 Social stratification in rural China

Social stratification theory is widely applied in Chinese rural studies. Back in 2006, the most relevant and widely accepted study available was Lu Xueyi (2002) who identified 8 social groups (shehui jieceng 社会阶层) in rural areas - from the bottom to the top: agricultural workers, migrant workers, contractors, rural intellectuals, self-employed, private entrepreneurs, managers of township and village enterprises (TVE) and rural officials. At the outset, the selection of cases was based on this classification. We tried to identify the most representative household belonged to each social class with the help from local contacts and our own observations, but the selection was limited by the accessibility and the villagers’ willingness. In the end, we selected 6 households in the two researched villages that could represent almost all the social stratifications of the village.

Table 6.2 Sample household selection in Taiping Village

Social Stratification in rural China based on Lu (2002) ¹⁴¹	In context of Taiping village/ Proportion of population in the village	Representative/ surname of the sample household
Agricultural workers	Normal villager who are relatively poorer than other classes/ 60%	An old very poor farmer/ Yang
Migrant workers	Migrant workers who usually do not live in the village, while the old parents and young children still live in the village/ 30%	Two left-behind old persons/ Dai, Zhang
Contractors		
Rural intellectuals	N	N
Self-employed and small business owners	Family workshop and small business owners who work and live in the village/ 10%	Family brush making workshop owner/ Zhuo
Private entrepreneurs	Entrepreneurs in the village who acquired the right to extract natural resources for profit, and usually enjoy a close relationship with village officials or have already become an official/ less than 1%	Sand mining factory owner/ Wang
Managers for TVE	N	N
Rural officials	Top village officials who have the most social, economic and political resources, and usually are economically far better off than the rest of villagers / less than 1%	Village Party Secretary/ Xing

¹⁴¹ I use Lu (2002) here because in the summer of 2006, when the case households were selected, Hou (2010) was not available.

Table 6.3. Sample households in Jinhua village

Social Stratification in rural China based on Lu (2002)	In context of Jinhua village/ Proportional population in the village	Representative/ surname of the sample household
Agricultural workers	Normal villager who are relatively poorer than other classes/ 45%	An old poor farmer/ Zhang
Migrant workers	Migrant workers who usually do not live in the village, while the old parents and young children still live in the village/ 40%	One left-behind old persons/ Li
Contractors		A contractor/Song
Rural intellectuals	N	N
Self-employed and private business owners	Family workshop and small business owners who work and live in the village/ 10%	Family pesticide business owner/ Song
Private entrepreneur	N	N
Managers for TVE	Top village officials are at the same time managers of TVE – a village brick factory, who have the most social, economic and political resources, and usually are economically far better off than the rest of villagers / less than 5%	Village Party Secretary and CEO of the brick factory/ Zhu
Rural officials		

Given that social stratification in rural China has been changing rapidly, due to fast socio-economic and landscape changes since the 21st century, Chinese rural social stratification theory has been developing as well. For example, Huang (2006) and Chen (2009) studied the changing social stratification of rural China from the perspective of the relationship between farmers and agricultural land. He (2011) also contributed to the theory by focusing on the occupational and spatial shift of rural citizens especially after the abolition of agricultural taxes.¹⁴² A more relevant study for my analysis is Hou (2010) who identified 7 social strata in rural China based on

¹⁴² With the increasing migrant workers, the abolition of agricultural taxes and other social changes, the farmer-land relationship, a fundamental relationship shaping rural society changed dramatically. These studies addressed such change in rural social stratification theories. Details are beyond the scope of my thesis.

the unit of households, instead of individuals. From the top to the bottom, they are: rural entrepreneurs' households (0.84% of the national rural households), high-income migrant workers households (13.5%), private businessmen household (9.97%), large-scale farmers household (10.77%), low-income migrant workers household (20.10%), traditional farmers household (22.78%), and poor elders household (22.04%). This classification is based on national samples and incorporates more up-to-date data, especially for the period after the abolition of agricultural tax. Furthermore, the household-based classification is more suitable for this study than individual-based, because the EE survey is household based. So I will use Hou (2010) in the following analysis.

Table 6.4 The 12 case households in Taiping and Jinhua villages:

Social stratification in rural China based on Hou (2010) (unit: household)	Taiping village	Jinhua village
1. rural entrepreneurs	1	1
2. high-income migrant workers	1	1
3. private businessmen	1	1
4. large-scale agricultural farmers	N	N
5. low-income migrant workers	1	1
6. traditional farmers	1	1
7. poor elders	1	1

Note: In both villages, large-scale agricultural farmers did not exist, so were not represented in the sample.

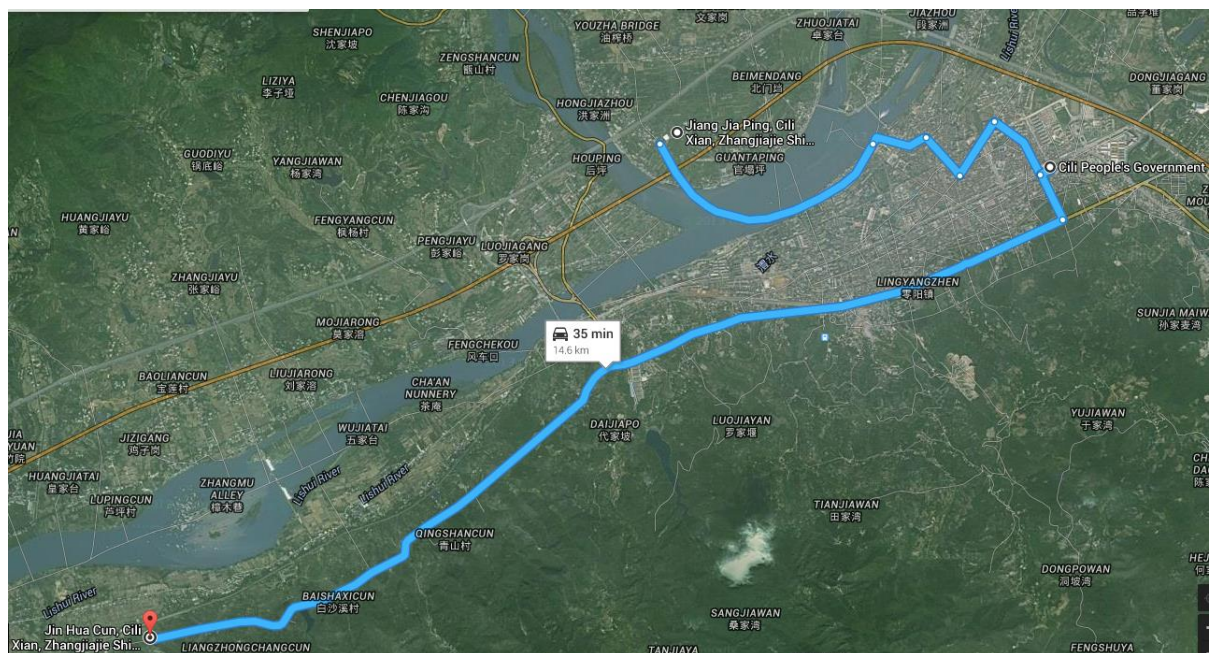
In the following fieldtrips that took place in May 2009 (spring) and October 2013 (autumn), the same 12 case households were followed up. Although some of the interviewees had died or left the village during the period 2006-2013, other members of the same households were interviewed.

6.4.5 Selection of the researched villages

Back in 2006, after Taiping village, Jinhua village was chosen for two reasons: 1. Jinhua village was economically more developed than Taiping, so that together with

Taiping, we could form a comparable pair to understand rural household EE in different economic conditions under similar climatic and cultural contexts; and 2. We acquired local contacts from Jinhua village, and the party secretary of Jinhua village, Mr. Zhu was very supportive of the survey. In 2006, the survey results, though only from a small sample, indeed show a relationship between economic status and attitudes towards EE. In the following 7 years, with the changing of landscape, urbanization gradually played a much more salient role than the original economic status in EE among the sample households.

Figure 6.11 Spatial relationship of Taiping, Jinhua villages and the urban center of Cili County



Note: assessed through google map on 11 December 2014.

Taiping village is adjacent to urban areas, just across the Li River that marked the urban-rural divide in 2006. In the rapid urbanization process, Cili was planned to expand across the river. Taiping village was planned to be the green and entertainment area in the Northern Expansion Urban Planning of Cili County (城市北扩计划). The other village, Jinhua village, is located in a more remote and

mountainous area to the SW of the urban area which was not included in the new urban planning. In terms of overall economic status, Jinhua was better off than Taiping in 2006, because Jinhua village had a brick factory and a firework factory thanks to their remote geography and an entrepreneurial party secretary. But later on, the economic growth brought by urbanization raised the average household income in Taiping village, while the village factories in Jinhua village were shut down for pollution control. By 2013, the two villages had become similar in terms of average household income.

In that case, although we were not aware of the coming urbanization process in Taiping village, the two villages chosen in 2006 provided a comparable pair to observe the role of landscape changes, especially urbanization in rural EE development in the future. The following pictures show some of the significant landscape changes in the two villages during the studied period.

Figure 6.12 The Li River Bridge construction in Taiping village in 2009



Note: Photo by the author.

Figure 6.13 The Li River Bridge that connects Cili urban area with the new planned urban greenery on the site of Taiping village in 2013 (facing the Cili urban area, photo was taken on the side of Taiping village)



Note: Photo by the author.

Figure 6.14 Jinhua Village brick factory that was the main source of income to the villager in 2009



Note: Photo by the author.

Figure 6.15 The empty site of the demolished brick factory of Jinhua Village in 2013



Note: Photo by the author.

6.4.6 Following up with the 12 households

After the Summer Holiday Practice Program, we finished a report and submitted it to the department. The report focused on explaining the relationship between villagers' economic status and their willingness to invest in EE. The team was disbanded afterwards. The following summer, in 2007, a large-scale rural household energy consumption survey was conducted in southern China still funded by the Ministry of Agriculture. Cili County was not included. I was employed by the Beijing Association of Sustainable Development to produce a documentary for EE development in rural Beijing in the summer of 2007, so did not participate in the survey in southern China.

In May 2009, in preparation for my undergraduate thesis, I went to Cili County to repeat the same survey and interviews with the same case households, party secretaries and officials of Taiping and Jinhua villages, this time with an emphasis on the changes after the rural household EE policies launched in 2007/08. I went with Jinghua, my classmates and Cili local as my assistants. The thesis focused on the emulation patterns of villagers in adopting household EE appliances. Both the 2006 report and the 2009 thesis are not published. Whenever materials appeared the two works are used in this thesis, they are cited.

In October 2013, I followed up with the same 12 case households, party secretaries and officials in both villages again with the help of a local assistant Zhuo Yu who is a friend of Jinghua. In all of the three fieldtrips, at least one member of the team was a Cili native, in order to ensure a full understanding of local language and context. It should be noted that, during this fieldwork, I was a doctoral student in a foreign university (Oxford) and did not belong to Tsinghua University anymore. But the locals still saw me as a student coming from Tsinghua, and I did not emphasize the change of my affiliation. There were two reasons: 1. I first entered the field as a student of Tsinghua and the trust between me and my interviewees were initially built on that. 2. A foreign institute that is not recognized by local people would usually raise suspicion. Also I was still part of the rural EE research team in Tsinghua, though it was a much less official affiliation than before. In this way, I maintained the same relationship with my interviewees despite of my changing university background.

With the three periods in the field, data collected from the 12 case households in Taiping and Jinhua villages spans the era before the household EE policies of the 11th FYP right up to the middle of the 12th FYP.

With the case study foundation laid, now we turn to the analysis of rural EE policy in two villages of Cili County, Human Province, China.

Figure 6.16 Interviewing the Yang couple - poor elders in Taiping village, 2006



Note: Photo by Liu Hongyan (research team member).

Figure 6.17 The Yang couple helping their son to build a new house in front of their old house in Taiping village in 2009. Photo by the author



Note: Photo by the author.

Figure 6.18 Son of the Yang couple's new house being constructed in 2009



Note: Photo by the author.

Figure 6.19 Yang couple's house in 2013. The couple is gone



Note: Photo by the author.

Figure 6.20 Yang's daughter-in-law and a villager inside their new house opposite to the Yang couple's old house in 2013



Note: Photo by the author.

CHAPTER 7: CASE STUDY RESULT

Following the case study background, this chapter will map out the case study result. The outline of the chapter is as follows: section 7.1 recaps the policy process framework that is used in the case study analysis; section 7.2 identifies the multi-layered contradictions within household EE policy in rural China; section 7.3 traces the connections between the policy processes described and the contradictions plaguing rural EE that hamper its success; in the discussion section (7.4), I consider the relationships between the multiple critical players affecting EE in rural China. Lastly, I conclude the chapter by summarizing the main findings of the case study and link to the final conclusion of the thesis.

7.1 Policy as zones of political practice

As I elaborate below, in the case of household EE policy in rural China, there are several layers of policy where the government (both central and local) contradicts its own policy purpose of promoting EE through a variety of means. To explain *why* and *how* such internal contradictions formed and continued, I am going to bring a less-discussed angle into this otherwise rich literature: how has the deeply intertwined relationship between EE and economic policies impacted EE development in rural China? And further, how does EE policy act as a dynamic shaper in the reinforcing interaction between the state, economic policies and EE development within a certain socio-economic and political environment?

The implications of the close partnership between EE and economic governance and policies penetrate all levels of policy process. In order to provide nuanced analysis of

this interlocking relationship, I will go beyond the dichotomy of policymaking and implementation, and apply a framework based largely on Schaffer (1984).¹⁴³ Schaffer argued that policy makers and implementers tend to create “escape hatches” to evade responsibility for the outcomes of their policy practices in several separate but overlapping arenas. Here, I will focus on the following policy practice zones where fieldwork findings and secondary materials are particularly abundant: The first is *Agenda Formation*, whereby statements of intention are announced; the second is *Resource Allocation*, which the state must rely on to proceed with a developmental project; the third is what Harriss-White (2002) calls *Access*, which refers to the politics of contact, involving the specification of eligibility, counter, queuing, exit options and the deployment of voices; and fourth is *Evaluation*, where the implementation of the EE target is measured, which is an important constituent of China’s EE regime.¹⁴⁴

7.2 The Contradictions of EE policy in rural China

Evidently, EE policy and the law that underpins it, aims at promoting and realizing EE; specifically, as defined by the Energy Conservation Law of People’s Republic of China (2007):

“For the purpose of this Law, energy conservation means, reduction of the volume of energy consumed, the loss of energy and the discharge of pollutants and prevention of waste of energy, at each stage from production through to consumption of energy, in order to use energy efficiently and rationally, this to be carried out through tightened control over the use of energy, and by adopting measures which are technologically feasible, economically rational, and acceptable by the environment and community.”¹⁴⁵

¹⁴³ For a detailed discussion on choosing the Schaffer (1984) as my framework for policy case study, please refer to section 2.4 (Chapter 2).

¹⁴⁴ I am omitting law and procedure in Schaffer (1984) because this part is elaborated in the case study background chapter.

¹⁴⁵ Article 3 in Chapter 1: General.

However, my empirical evidence shows that China's rural household EE policy contradicts this purpose in many ways, substantially limiting the impact of the tremendous fiscal funding and social-political resources channeled toward rural EE since the 11th FYP.

Three forms of contradiction arising from the powerful influence of economic policy on rural energy policy implementation are identified and illuminated in detail below:

1. saving energy by stimulating consumption; 2. subsidizing EE and re-enforcing the existing social stratification; and 3. investing in EE while enacting massive destruction. By analyzing these three intersecting components, we will develop a nuanced understanding of the dynamic contradictions of EE policy in rural China.

7.2.1 Saving energy by stimulating consumption

From 2008 to 2012, the policy of “Household Electrical Appliance Going to the Countryside” (*Jia Dian Xia Xiang*, henceforth JDXX) became one of the flagship EE policy programs in China. JDXX started its pilot programs in December 2007 and scaled up nationwide around 2008/2009. The program subsidized 13% of the final price of selected household electrical appliances (Ministry of Finance, 2008a). One of the most important selection criteria of the subsidized products is that they should be *Energy Efficient and Environmentally Friendly* (节能环保) (Ministry of Finance, 2008b).¹⁴⁶ The subsidy is only available to consumers holding rural household registration (*Hukou* 户口). Since the program was launched, a total of 59.2 billion

¹⁴⁶ Article 8 in Chapter 2: Production of JDXX Products. See the Appendix of the policy for detailed requirements for “energy efficiency and environmentally friendly” home appliances standards.

RMB of government subsidies has been allocated to support it, of which the central government's contribution has accounted for 80%, while sub-national governments picked up the remaining 20%. This made JDXX the second largest government subsidy scheme among all the EE policy programs in China. In 2012 alone, nearly 80 million items of home appliances worth 215 Billion RMB were sold under this policy scheme, reaching an annual growth in uptake of 20%.¹⁴⁷

JDXX's focus on EE, targeting solely of the rural population, large scale in subsidies and high volumes of sales made it a critical and high-profile nationwide policy program to promote household EE in rural China. From 2007 to 2010, rural ownership of washing machines increased by 24%, refrigerators by 73%, air-conditioners (AC) by 187%, computers by 180% and mobiles by 75%.¹⁴⁸ Fieldwork findings echoed the national result. The first fieldtrip took place before the JDXX program: among the 12 case study households selected in two villages, only 1 had AC, none had solar heater, and only one third used electrical appliances for cooking. The second fieldtrip in 2009 revealed a clearly observable increase in the ownership of solar heaters (9 out of 12), ACs (6), electrical cookers (7), washing machines (10) and computers (8).

Both the official data and fieldwork findings seemed to imply that the JDXX program was successful in achieving its policy goal of growing EE home appliances in rural areas. However, during the second fieldtrip, households that recently bought ACs in both villages indicated that ACs were rarely used in everyday life. Even during the

¹⁴⁷ Data according to the Department of Commerce, see: <http://finance.china.com.cn/news/gnjj/20130107/1223721.shtml> [last assessed 22 June 2015].

¹⁴⁸ Ibid, see: <http://finance.china.com.cn/consume/special/jdxx/20121120/1142498.shtml> [last assessed 22 June 2015].

fieriest months of summer (July - August) when the highest temperature reached above 35 °C, the households still used AC for less than 2 hours per day, normally right before going to sleep.¹⁴⁹ There were two main reasons for the under-usage: 1. Prohibitively expensive cost of electricity; 2. Mismatch with the living style. As one villager said in interview: “The electricity is very expensive. It is a luxury good, not really a basic need. Our son bought the AC on the JDXX scheme. He works in the city with his family, coming back only during the Spring Festival. We are too old to get used to AC.” The situation with the uptake and washing machines and electrical cookers was similar.

Before JDXX and other EE related policy programs targeting rural China were scaled up in 2008, academics had a heated debate on what kind of EE was needed for rural China. Scholars agreed that the key issue was to manage and control the growing rural household energy demand. Clearly, China’s severe energy scarcity could not allow its then 900 million rural citizens to live as energy intensively and “luxuriously” as urban dwellers. Suggestions based on thorough studies of rural living styles promoted improving the existing building materials, structures and lifestyles, rather than blindly applying a set of new electrical appliances, which were themselves electricity consuming. For example, scholars had proposed several methodologies to raise room temperature in winter with better design of the traditional *kang* in North China (Yang et al., 2010). Customized solutions to fit different climate zones and

¹⁴⁹ Normally, if the house is well insulated and shaded, it is possible to keep a comfortable level when external peak temperatures reach 35 °C. But the construction boom that widespread the researched areas since 2007/08 has changed the traditional architecture style, and made the houses less adaptive to the weather. This part will be elaborated in the following sections.

living styles in rural areas across the country were also crafted by academic and civil society communities.

But, JDXX, one of the most notable household EE policy chose to continue in the opposite direction. Instead of carefully managing and controlling rural energy demands, the government decided to cultivate the potential energy demand from rural households to its fullest. Now, not only did the government continue to grant huge subsidies, but it also mobilized nationwide campaigns of propaganda for promoting JDXX. During our fieldtrip in 2009, Cili county streets were full of red cloth boards on which were written “JDXX: miss this opportunity, and regret it your whole life (家电下乡：错过一次，后悔一生)”.

In 2009, only a year after nationwide JDXX program started, studies published in both official newspapers and academic journals already argued that given the lack of social welfare in rural areas, JDXX might overdraw the rural consumption ability in advance, meaning that using policies to induce consumptions that would otherwise naturally happen in the future, which was not sustainable in the long run (Zhang, 2009, Guo, 2009, Wang and Tang, 2009, Zhi, 2009). However, the government insisted on implementing and even enlarging the scale of JDXX. The listed categories of products expanded, and the amount of subsidy increased.¹⁵⁰ The program ran for the whole three years from the beginning of 2009 to the end of 2011.

¹⁵⁰ In 2008, the first list of JDXX subsidized products included only four categories of electrical appliances: TV, refrigerator, mobile, and washing machine (Ministry of Finance, 2008). A year later, the list expanded into nine categories to include AC, water heaters (solar and gas), electrical cookers and microwaves (Ministry of Finance, 2009a).

Promoting EE by stimulating consumption at any cost, the seemingly contrasting logics of China's flagship rural household EE policy, constituted a first layer of internal contradiction within EE policy.

7.2.2 Subsidizing EE by re-enforcing the existing social stratification

On our second fieldtrip to Taiping village (2009), the whole village was undergoing a construction boom. More than half of the households were building newer and higher houses. The 2008 financial crisis had reduced employment opportunities in the export-oriented factories in coastal areas. Many inland migrant workers temporarily came back to their villages to await the end of the crisis. With the money saved over nearly a decade, they started to build new houses. Some of the newly constructed homes I visited were almost empty inside.

“The money we have is just enough for the construction. We will save to refurbish, and to fill in furniture and other home appliances in the following years. Let's first make a living under the new shelter. The rest, step by step (*bianzou biankan* 边走边看).” Said a villager.

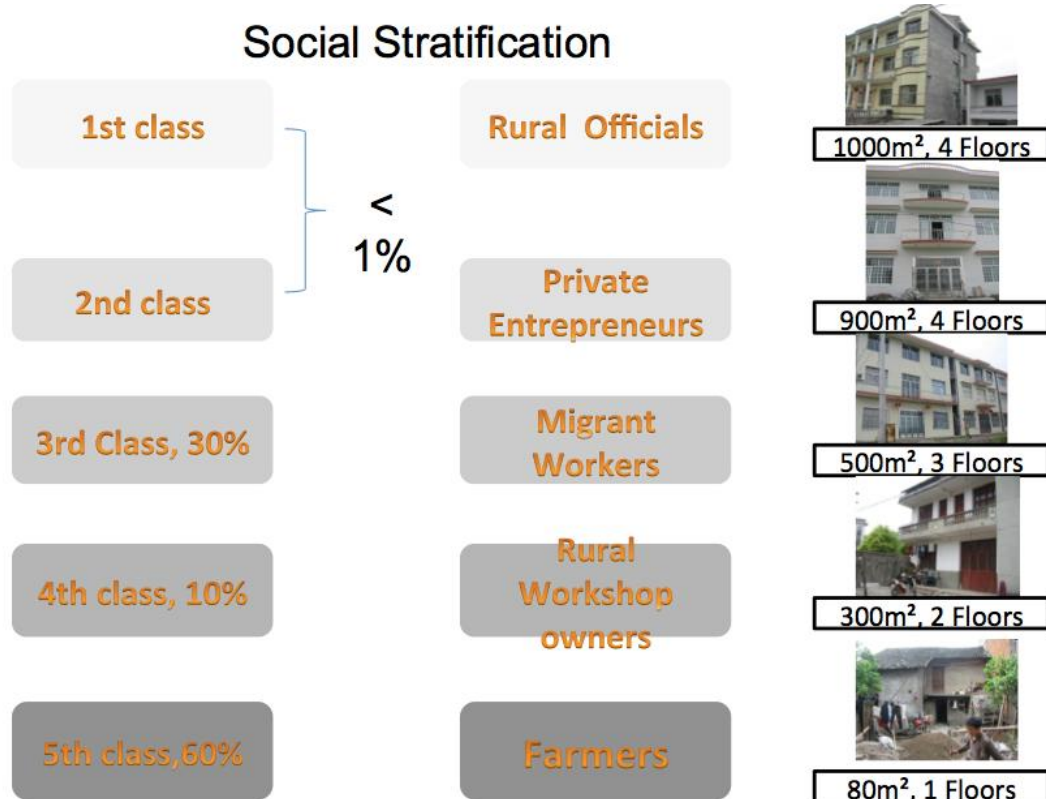
2009 was also when JDXX was at its height. Despite the fact that more than half of the households with new constructions were living in a barely comfortable condition due to financial constraints, those that were better-off had already started to decorate their homes with the JDXX subsidized products. Observations of the selected households obviously showed a close relationship between the wealth of the households and the size of their subsidized solar heaters and air conditioners. Contradictorily, there was no positive correlation between the size of the households (measured based on the number of people actually reside in the household) and the size of the subsidized home appliances.

Taking the solar heaters in Taiping village for example,¹⁵¹ a clear hierarchy appeared between the households' social classes, the size of their houses and the size of their solar heaters acquired under the JDXX policy scheme. In order to explicitly show the hierarchical relationship, social stratification theory is applied in the following analysis.¹⁵² As shown in Fig. 7.1, based on the abundant scholarship of social stratification in the context of rural China (Lu, 2012, He, 2011), I identified 5 classes in Taiping village: 1. Village official (party secretary in this case), 2. Private entrepreneurs (owner of a village based sand factory), 3. Migrant workers (households that mainly rely on the income of migrant workers), 4. Village workshop owners, and 5. Farmers.

¹⁵¹ I choose solar heater rather than ACs, fridges and other listed JDXX listed HA as example here mainly for two reasons: 1. Solar heater is a relatively new HA demand compared to others, which shows more explicitly the relationship between the government and market stimulations and villagers everyday life; and 2. Solar heater can be displayed on the roof, so that others (both villagers and outsiders) can see clearly the owner's possession of it and the social and economic status it embodied. This point will be elaborated in latter half of the section.

¹⁵² See Chapter 6 for details.

Figure 7.1 Social Stratification, household living space and solar heaters in Taiping village



Source: author's fieldwork data.

In Taiping village, the first two classes account for less than 1% of the total households, but they make up approximately 10% of the total housing spaces in the village.¹⁵³ The party secretary of Taiping village owned a four-storey mansion of 1100 m². Only three people live in there: the party secretary, his wife, and their young grandchild. The researched private entrepreneur's house was slightly smaller than it, which had four floors of 900 m². Only 2 people lived in the house: the factory owner and his wife; their teenage child was in boarding school far away from the village, and came back only occasionally. Those two classes formed the top classes in Taiping village in terms of wealth and power. Visibly, they owned the largest solar heaters in

¹⁵³ Calculation based on fieldwork data.

the village - the shining solar panels on their roofs reflected their social status rather than commitment to EE; It makes little sense for a household of less than 3 people to use a solar heater enough for 5 people to take shower (*Xizao* 洗澡) at the same time.

The next class down the ladder was composed of migrant workers' households. They normally owned 3-storey houses of around 400-500 m² each. In most cases, only the migrant workers' old parents and young children lived there. This class, as a group, tended to buy more cost-effective solar heaters that provided just enough hot water for one or two people to take shower simultaneously. However, not all of the households in this class had solar heaters at that time. The villager who owned a newly-purchased solar heater under the JDXX scheme proudly showed it to me and warmly invited photo taking. She said in interview: "JDXX is a good policy, we got solar heater more cheaply." When asked how often they used the solar heater, the villager replied:

"Not very often. It is not very stable, and it still consumes extra electricity, which is expensive. But we can sometimes take shower with warm water now! They (the neighboring household which belongs to the same class) do not have one. They still can't afford to take a warm shower. Their son is clearly not filial enough (*Xiaoshun* 孝顺) towards his parents."

Xiaoshun, means devotion to family, especially of the younger to the elder generation, and is the most important informal contract between parents and children in rural China, where the social security system is lacking and old people depend on their children for income equivalent to a pension and other welfare (Thøgersen and Anru, 2008, Fisher et al., 2011, He, 2008). Thus, as shown, the ownership of solar heaters was interestingly translated by a certain class of households into a reflection of wealth, in addition, a symbol of a migrant worker's devotion to their left-behind parents in the village.

The bottom two classes of the hierarchy, rural workshop owners and farmers households, though together accounting for around 70% of the total village households, had not had a chance to benefit from the JDXX scheme, because they simply could not afford to take advantage of it. A farmer villager who lived in a humble one-floor house said in interview:

“We are saving to build a new house. Everyone in the village is building new house. I feel I am losing face living like this...JDXX? I’ve heard about it, but it is not relevant to us. I cannot afford (to purchase anything under it). We are saving for a new house; only with a new house, can I have standing (*zhi qi yao lai* 直起腰来) in the village.”

In Taiping village, only around 50 households out of the total 710 owned solar heaters by the spring of 2009, which is to say, approximately 7% of the village households;¹⁵⁴ but all of that 7% households belonged to the top three classes. A similar situation was observed in Jinhua, the relatively better off village as well, where around 100 out of 268 households owned solar heaters.¹⁵⁵ The situation did not change much by the third fieldtrip in fall of 2013: though more households owned solar heaters compared to 4 years ago, the relationship between ownership of solar heaters and social stratification remained unchanged.

Pelling (2011) and Pelling et al. (2012) argued that adaptation to climate change could come in the form of persistent resilience in maintaining existing unequal structures, or it could provide a way to transform long-standing social relationships. The case of solar heater acquisition in Taiping village has shown that, JDXX as a flagship household EE policy in rural China tends to reinforce the existing social stratification, rather than to “transform” it. As the village factory owner rightly pointed out:

¹⁵⁴ According to interview with Taiping village party secretary.

¹⁵⁵ According to interview with Jinhua village party secretary.

“Of course I would go for the big one. The government subsidizes the same portion of the price of the selected products of all sizes. The bigger I buy, the more subsidy I get. Why not?”

And on the other side, the majority of the villagers did not even relate JDXX to themselves, because they “could not afford” to be included.

Such results are totally at odds with the stated policy purpose “to support agriculture and benefit farmers” (Ministry of Finance, 2009b). In fact, JDXX most benefited the better off households in a village - who were not attached to, or only partially related to agriculture (He, 2011). Moreover, having elaborated in the previous chapter, rural EE is a constructed policy concept that combines several political, economic and social agendas. The policy result even contradicted its central, integral purpose of increasing EE. On the contrary, JDXX adoption became deeply interweaved with the social relations, particularly showing off wealth, status and filial piety in rural everyday life. When the size of a solar heater became a symbol of money, power and even love to parents in the local context of rigid social stratifications and cultural traditions, owning EE products no longer necessarily lead to EE practices. Rather, it created new channels of energy waste and domestic overcapacity.

Consequently, promoting EE in such a way that the existing social stratification was reinforced, constitutes a second layer of self-defeating contradictory practice in the EE policy of rural China (in addition to the first layer of “promoting EE by stimulating consumption”).

7.2.3 Investing in EE while promoting massive demolition

Apart from JDXX, the other two pillars of rural EE schemes in China since 2006 have been the pooling of biogas (methane) and EE in constructions.

In 2009 alone, the central government funded 5 billion RMB to build approximately 1.7 million biogas pools of different scales in rural households, farms, communal village areas and 50 service stations at county level (Ministry of Agriculture, 2009). In my field visit in 2009, both Taiping and Jinhua villages already had more than 100 households with newly constructed methane generating pools under this subsidized scheme.¹⁵⁶ Jinhua village was even the pilot village for household methane pools, which was a source of great pride for the local party secretary. The villagers, on the contrary, seemed to be less than passionate about it. Most villagers interviewed explained that they agreed to build the methane pool only because the party officials were so persistent in persuading them.

“It is not that essential to us...but the party secretary said that the country would pay for it. I only needed to offer some labour in constructing. In the end we nodded.”

After four years, in 2013, when I visited the two villages again, hardly anyone talked about methane pools anymore. In Taiping village, the construction boom was still on, though for a different purpose. The county government planned to urbanize a large part of Taiping village in 2015. 40 households had already been demolished for the construction of a planned highway. In order to find one of the sample households, Mr Zhuo, I had to travel to the villager's new shop in Cili County. His house no longer existed in Taiping village.

¹⁵⁶ Methane is considered to be a renewable and clean energy that can be generated by individual household (using livestock manure) for cooking or heating purposes in rural areas.

The once rural workshop owner told me that after the government demolished his house for urbanization in 2012, he used the government compensation to start a small business. The family rented a place near town with government subsidies of 1,000 RMB per month (the actual rent was fully covered by the government). I asked him about the progress of rural household EE since my last visit. He said:

“My house is totally demolished; EE went up a storey even higher!”
Asked about the methane pool, he replied: “We have been urbanized. No need for a methane pool anymore...”

When I tried to find Mr Zheng, a retired village official whose household was also in the samples, relatives temporarily living in his house informed me that he had passed away. Noticing that the house was in a poorly maintained condition, I asked if they had any EE related reconstruction plan. The relatives told me that after the urbanization plan for Taiping village had been unveiled the government prohibited all kinds of household reconstructions, whether EE related or not:

“The government is afraid that people will build more houses in order to get more compensations during demolition and relocation (*Chaiqian* 拆迁). Not even refurbishment is permitted, because someone built one more floor inside their house and requested the government to include the additional floor space when calculating the compensation he should receive...we are just surviving here, waiting to be demolished and moving to the city maybe...we don’t know the future, let it be.”¹⁵⁷

The methane pool that was built only five years back had now been totally abandoned, and covered with dust.

According to latest survey data in Gansu province conducted by Tsinghua University, merely 30% of the methane pools built under the government subsidy program are still in normal function. National Bureau of Statistics data shows that by October 2014, the usage of methane pool was significantly declining in Shaanxi province –

¹⁵⁷ Also see “Building extensions and waiting for compensation” in (Lora-Wainwright, 2012).

most of the villages has only 40-60% of normal usage. Xinhua News Agency reported that in Ningxia province, as high as 56.9% the methane pools had been given up by June 2014. The number was to even 90% in parts of Heilongjiang province in 2009.¹⁵⁸

International EE scholarships says that EE is a cost-effective investment because it gives returns in the long run (IEA, 2013, Eyre, 1997). Based on this theory, a robust EE market has developed worldwide. It has also provided legitimacy for EE subsidy in contemporary China: the argument has emerged that in a country without a sophisticated and efficient financial market and mature business models for EE, the government should take responsibility for funding EE in the initial phase (Qi, 2011). There are two essential components of this argument: 1. Initial investment is needed; 2. EE realization takes time. Both must be fulfilled in order to make EE cost-effective. Paradoxically, the case study shows how the government chose one of the essentials, while abandoning the long-term sustainability. The significant amount of financial and political resources committed to EE in rural China is unprecedented in the world. At the same time, the state's prioritization in deciding to urbanize large parts of the rural areas¹⁵⁹ before harvesting EE results after all those endeavors defeats the original purpose. This thus constitutes the third layer of contradiction in EE policy in contemporary rural China.

7.3 Policy Process and Contradiction Formation

¹⁵⁸ See: http://m.thepaper.cn/newsDetail_forward_1288753

¹⁵⁹ According to National New Urbanization Plan 2014-2020 (国家新城镇化规划 2014-2020) , urban residents should reach 60% of the total population by 2020 compared to 52.6% in 2012.

The multi-layered contradictions embedded in EE policy in rural China obscure our understanding of China's EE and broader low carbon policies in the 11th FYP. As I described in the section 7.1 above, the following analysis will apply a framework composed of four policy zones in order to make sense of the close interaction between policy process and contradictions of household EE in rural China.

7.3.1 Agenda Formation and Resource Mobilization

As early as 2006, the State Council had already issued an important decision on “strengthening energy conservation work” (State Council, 2006). In the same year, the government abolished the agriculture tax and introduced the “Building a New Socialist Countryside” program. However, it was not until 2008 that concrete policies, and resources, in the form of significant government investment, came in to establish and materialize EE policy programs in rural China.

Taking JDXX as an example, as early as November 2007, the Ministry of Finance and the Ministry of Commerce had already decided to pilot JDXX program in three provinces of China. In the related policy document, JDXX was portrayed as a way to “enlarge rural consumption, increase rural life quality, and better coordinate rural-urban development and domestic-overseas market”, and of course “promote building a socialist new countryside” (Ministry of Commerce and Ministry of Finance, 2007). EE was not part of the JDXX agenda in the first place. The 13% subsidy that JDXX provided was close to China's tax export rebate for home appliances (HA). The Ministry of Finance noted that, since HA were previously purchased by urban citizens, JDXX could allow rural citizens to benefit from government subsidy as much as urban areas (Zheng et al., 2012). In other words, JDXX in fact started as a program to

stimulate rural consumption facing the persistently widening rural-urban gap. In 2007, the year of the JDXX pilot program started, urban household ownership of home appliances was significantly higher than rural areas. As shown in Table 7.1, there was not much potential for further stimulating HA consumption in urban areas. Both the government and industry therefore identified rural households to be the next bases for HA consumption.

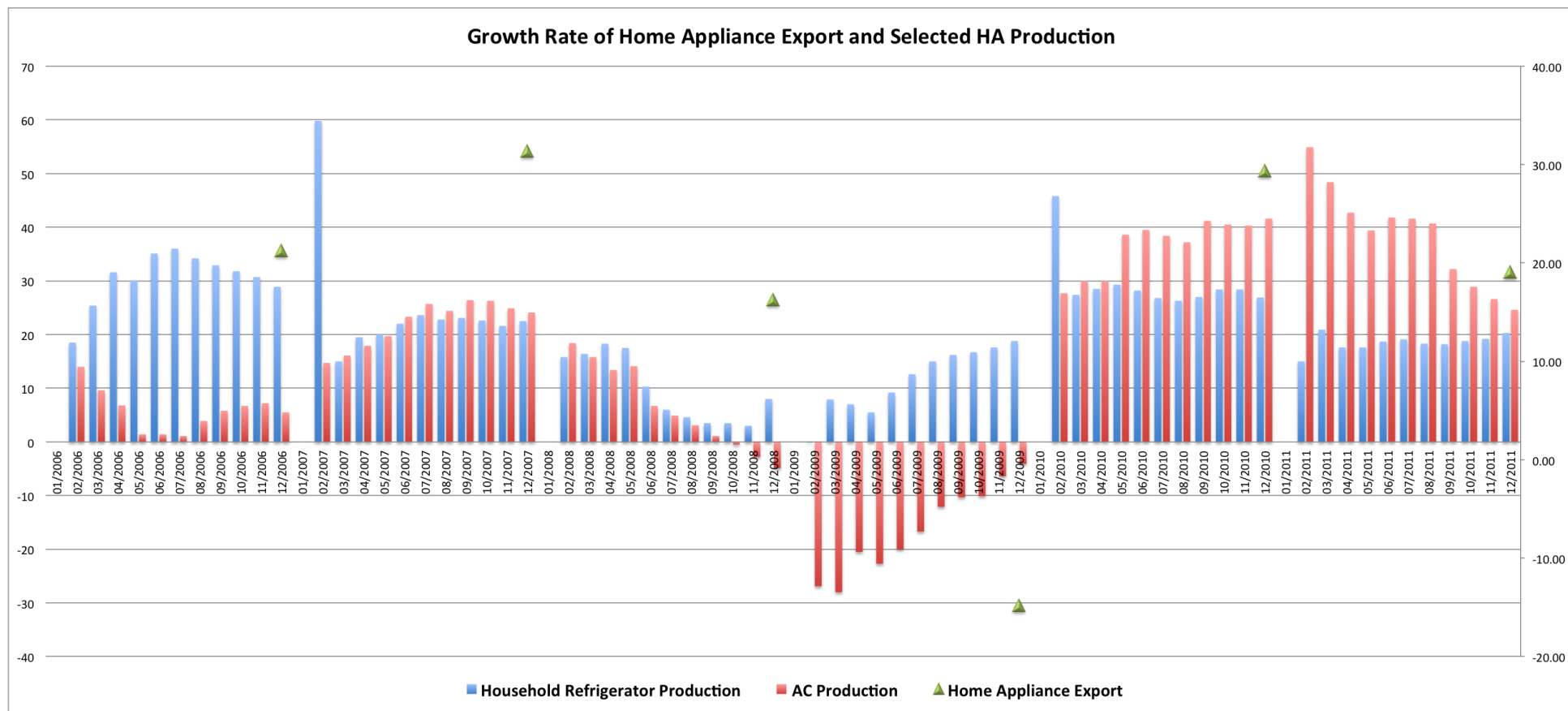
Table 7.1: Selected HA ownership in every 100 rural and urban households in 2007

Type of HA	Rural households	Urban households
Washing machine	45.94	96.77
Refrigerator	26.12	95.03
Color TV set	94.38	137.79
AC	8.54	95.08
Telephone	68.36	90.52
Mobile phones	77.84	165.18
Computers	3.68	53.77

Source: China Statistical Year Book 2009

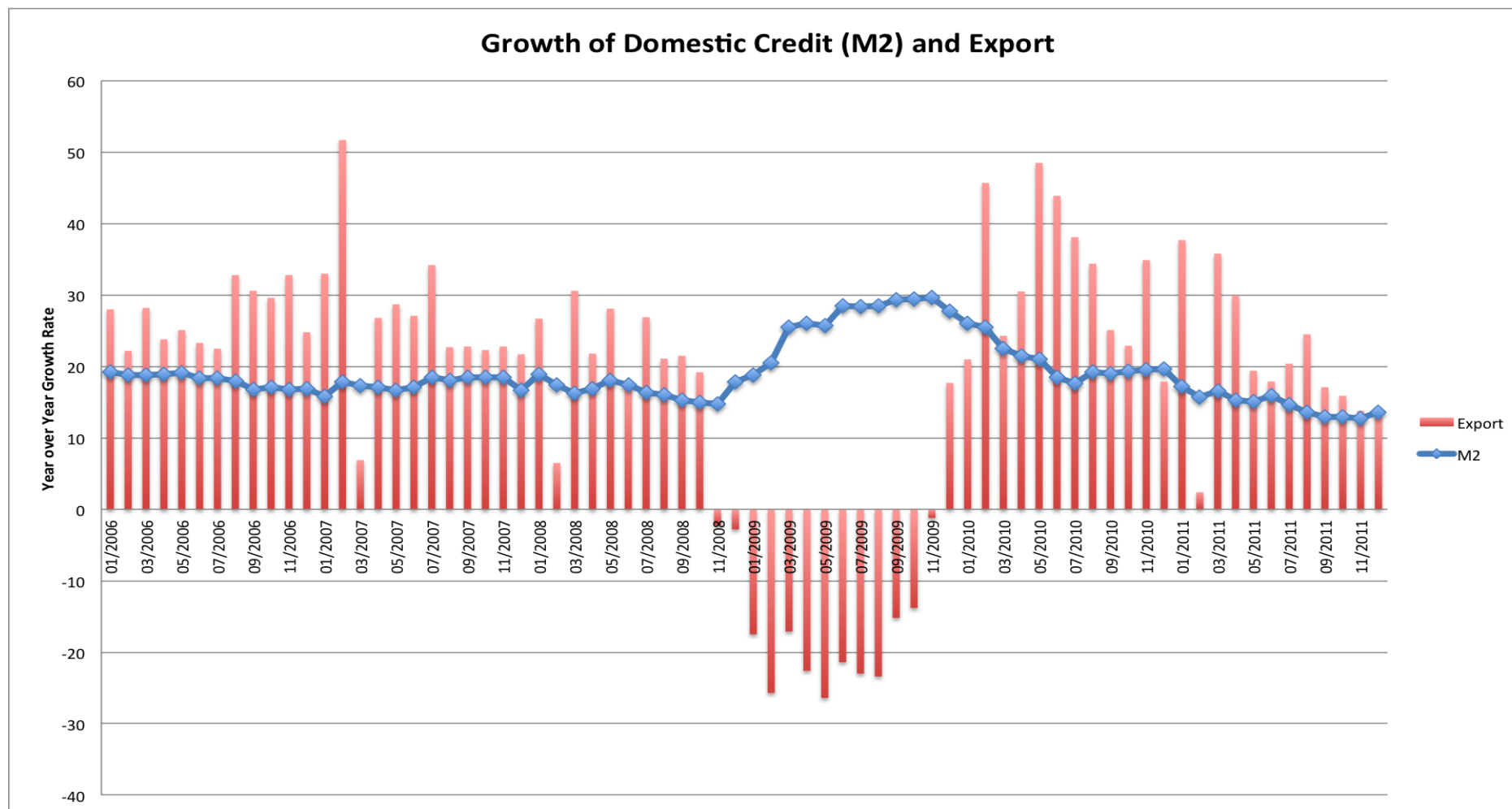
Apart from the domestic market, HA has been an important source of China's trade surplus. In 2007 alone, the export volume of HA was 34.8 Billion USD (approximately 3% of total export volume), reaching a year on year (YoY) growth rate of 31.4%. As shown in Fig. 7.2, after the financial crises, in 2008, the HA export YoY growth rate reduced dramatically to 16.3%, the lowest since China joined WTO in 2001; and in 2009, the growth rate even fell to 14.8%. At the same time, responding to the crisis, the government decided to launch the Four Trillion RMB Stimulus Package. Yet into 2010, the export and production of HA suddenly recovered to the same level as before the financial crisis. The effect of the stimulus package was immediate.

Figure 7.2: Growth Rate of HA export and selected HA production in China's 11th FYP (2006-2011)



Source: China National Bureau of Statistics. Monthly figures updated regularly at www.stats.gov.cn/tjsj

Figure 7.3: Growth of M2 and Export in China's 11th FYP (2006-2011)



Source: China National Bureau of Statistics. Monthly figures updated regularly at www.stats.gov.cn/tjsj

As Fig. 7.3 shows, to support the stimulus program, credit supply (M2) increased by 30% in the year of 2008/2009. And its effect on overall export was as significant as in HA. In order to fully spend the Stimulus Package and boost the economy, calls for stimulus program proposals were distributed to all levels of governments.¹⁶⁰

It was with this background that the government decided to scale up the JDXX program in December 2008 from its initial pilot provinces to national level (Ministry of Finance, 2008b and 2008c). The types of listed products in the program also gradually increased from 4 in 2008 to 10 in 2010. It was also in the context of this stimulus package that EE as an overall objective was bundled into several socio-economic policy programs, including JDXX and methane pool construction. In the year of 2008, the public fund for subsidizing methane pool construction in rural area increased by 6 billion RMB.

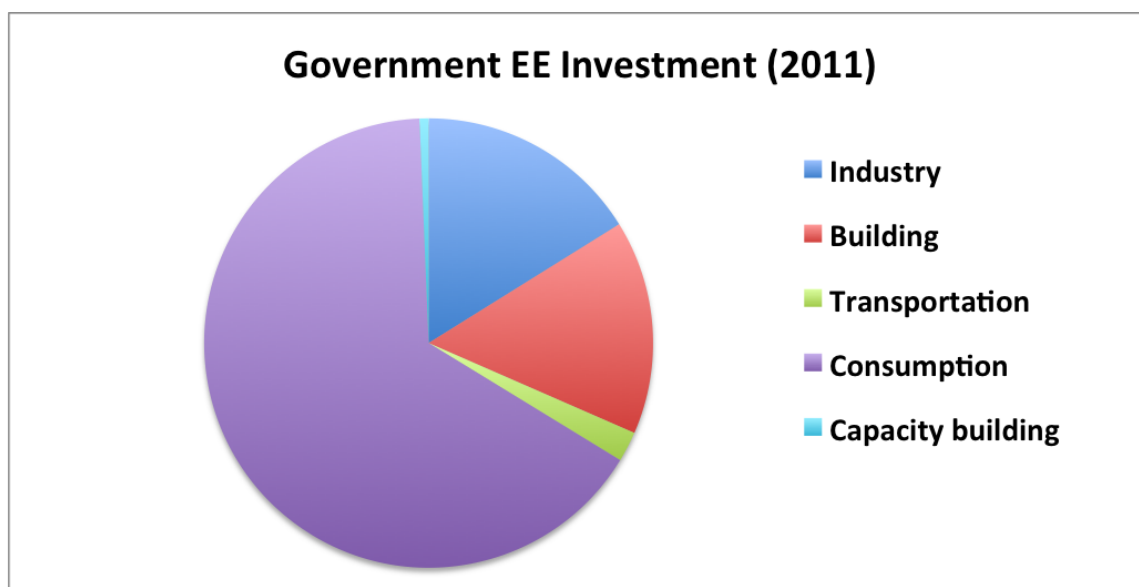
When asked about the purpose to bound EE into the household consumption stimulus package after the financial crisis, an anonymous official in the Committee of Environment and Resource of the Standing Committee of National People's Congress articulated it well in September 2013's fieldwork interview:

“Energy Conservation and Emission Reduction (ECER) was among the top national strategies for 11th FYP. The economic stimulus package needed to strengthen its legitimacy by relating with other national strategies. The reason was simple: as a new and urgent strategy, the stimulus package had to accommodate itself to the existing policy tracks, especially the implementing trajectories that were already established around the existing strategies. By that time, the motivation, resource allocation and evaluation systems of ECER were in function. So bundling the consumption stimulus package with promoting EE became natural – it brings more resources to ECER, and make the stimulus package more reasonable.”

¹⁶⁰ The 4 Trillion Stimulus Package was only the part of the credit increase. See (Naughton, 2012).

Since then, consumption-stimulus-oriented EE public investment has become the government's most notable strategy towards ostensibly achieving EE at the same time as stoking the economy by using rural consumption to compensate for the loss of overseas market. As Fig. 5 shows, in 2011, the consumption-oriented government EE fund, accounted for 65.62% of the total government EE investment, reaching a total of 83.3 billion RMB.

Figure 7.4 Government EE investment by category of China (2011)



Source: adapted from Table 5-3, p155 in (Qi, 2014)

It was also during this same period of time that China's EE related government fund expanded at an unprecedented rate (Qi, 2014, p151). The abundant credit flow brought by the Stimulus Package, as well as the government's strong determination to regain fast economic growth, made the resource mobilization process, both in terms of financial resources and political will too smooth to give it a second thought. As a consequence of the haste to implement, some of the crucial questions in securing an

effective EE subsidy program were neglected. For example: were Chinese industries well equipped up to the newly introduced EE standards? How should transparency and credibility in production, branding, evaluating, sales and after-sale servicing processes be ensured? And further, who, on both the consumption and the production sides, will the subsidy benefit, and would the distribution of these benefits comply with the equality goals in related social and development policies?

The interest-bundling theory (Kostka and Hobbs, 2012, Harrison and Kostka, 2014) argued that the Chinese government's strategy of combining the seemingly competing interests of economic growth and EE together in one policy program showed its skill and effectiveness in promoting EE. However, the agenda setting and resource mobilization process of the JDXX program shows that EE was rather a supplementary factor when bundled into economic policy programs, especially given the political and economic environment of China's response to the global financial crisis – the short-term economic goal above all. In addition, whether a policy can ever achieve multiple competing interests in contemporary China where economic growth is still the single most important state priority remains unclear. JDXX had to first of all serve its prior goal to stimulate rural consumption in order to counter the financial crisis. It is still debatable whether it has made any headway in achieving the second priority of balancing the rural-urban living-standard gap that has increasingly led to unsustainable economic and social development, the Building a New Socialist Countryside Policy Scheme. Although the rural-urban HA ownership gap indeed decreased during the 11th FYP, as I have mentioned, fieldwork findings echo several large sampling research studies to show that JDXX benefitted the better-off

households in rural area the most, which has led to even higher inequality among rural households (Wang, 2011).

EE itself, languished at the bottom of the list of policy goals of economic growth and rural development, was thus the most vulnerable to being compromised. The intrinsic conflict between protecting high economic growth by stimulating consumption and secondly fighting persistent inequality was itself impossible to overcome. This conflict was embedded in rural household EE policy in the first place, and laid down the foundations for policy contradictions throughout. It was unrealistic to expect supplementary, EE elements in the policy agenda to make any constructive change in “transforming the existing social relationship” as the benign hopes of theories and stated aims of policies have suggested.

Under this close imbrication between economic and EE policies in agenda-setting and resource mobilization process, when the policy raft of *New Urbanization* (*Xin Chengzhenhua* 新城镇化), which re-emphasized the engine of economic-growth, was molded by the government in the 12th FYP (Li, 2012), massive destruction in rural areas accompanied by large-scale construction for brand-new cities further destroyed the already weak foundation of EE in rural China. With the demolition of old living landscapes and “traditional” lifestyles, there left a minimum of social space, or willingness, for millions of forced rural-urban migrants to incorporate EE and sustainability into their lives. Such uncertainties additionally gave negative incentives to EE in the not-yet-urbanized rural areas, because EE investment becomes cost-effective only in a relatively *stable* future and the dual upheavals of rural destruction and rural-urban migration were anything but stable.

7.3.2 Access

Exclusive and unequal access to EE subsidy was a problem among both the EE product consumers and producers.

In both the JDXX and methane pool construction programs, the unequal social access to the government subsidy contributed to the growth of material inequalities among rural households. The case of solar heaters and methane pool program echoed the inequality of access along lines of social class and wealth. Displaying the huge solar panels on the roofs, the top classes in the village showed off their wealth and power, while the following classes exhibited their children's devotion to their family through their smaller, but still apparent investments. Such behavior displaced EE from a category of social goods into hierarchies of private wealth, power and family bonding in rural China - where all three are the more highly valued because of a fast-changing society with a minimum of social security. The alienation associated by EE created new channels of waste, because the psychological and behavioral patterns of "showing off" encouraged people to obtain EE products that exceeded their basic needs.

In turn this led to waste:

1. Production involving human labor, raw materials and capital - with negative environmental consequences;
2. Uses that include electricity and maintenance;
3. Precious public funds funneled towards EE.

The upper classes, who benefited from EE subsidies created and maintained social distance between those less well-off through their conspicuous use of EE products as status symbols. By doing so they also promulgated the connection between EE and social status to lower classes in the village. As the interviews with poorer households in Taiping and Jinhua villages showed, the poorer the household, the less confident and interested in the potential of EE. On the one hand this process reinforces the existing social stratification, on the other it posed serious questions about the sustainability of EE policy program: after the substantial government subsidy program is eliminated, and in the absence of a social foundation for bottom-up EE development, how do we understand the achievement of EE subsidies and its implications for future EE development?

Similarly, the substantial public fund increase led to a sharp rise of methane pools in numbers – the number of household methane pools in rural area more than quadrupled between 2000 and 2012. But the “Great Leap Forward” of methane pool construction could not deter villagers from using them. The criteria of the access were not for those who really needed, but for the purpose of spending the public fund and meeting ECER targets. Researchers from Tsinghua University calculated the waste: if one province constructed 1.25 million methane pools, each cost 4,000 RMB, and half of them were not used, then 2.5 billion RMB is wasted in one province.¹⁶¹

On the producers’ side, along with the JDXX program, there are also policy programs to subsidize producers of EE HA. In May 2009, around the same time that the nationwide JDXX program began, the Ministry of Finance, along with the National

¹⁶¹ See: http://m.thepaper.cn/newsDetail_forward_1288753 [last assessed 22 June 2015]

Development and Reform Commission (NDRC) issued a Notice on developing a project to promote “energy-efficient products for the benefit of the people” (*Jieneng Chanpin Huimin Gongcheng*, henceforth JCHG). The Notice announced that the government would subsidize HA brands that made products with high standards of EE, and above a designated size. The subsidy could be used in all kinds of expenditures occurred in product promoting activities.¹⁶²

Like JDXX, the JCHG subsidy does not only come with financial support, but also substantial political resources: the Notice requested all the local governments to strengthen leadership, coordination and propaganda with effective methods, in order to make sure of the smooth implementation of JCHG (Ministry of Finance, 2009a). When JDXX had just been launched, the listed products eligible for subsidies only included a few major domestic HA brands, such as TCL, Haier, Gree, Changhong, Galanz, and Midea. Those major brands were main contributors to China’s HA export and therefore those that suffered most during the financial crisis. Because of this, those brands received the most attention and policy benefits from the government. The list later expanded to include international brands such as Panasonic, Sharp, LG and Sony. In case of JCHG, only the products that had reached a certain degree of sales were eligible to the subsidy program, in other words, the access to the producers’ subsidies is only available to major brands with high market share.

That major brands had more or less exclusive access to the EE subsidy was rationalized by the government with two arguments: 1. major brands have a better financial and technological foundation for EE; and 2. major brands enjoy higher credit

¹⁶² See Article 10 in Chapter 4: Scope and Standards of Using Funds in (Ministry of Finance, 2009a).

ratings that may reduce the regulatory cost to the government. However, on 21 June 2013, the National Audit Office of the PRC published a report that revealed cheating of EE HA subsidies out of 90.62 million RMB by 8 famous HA companies that had been listed on both JDXX and JCHG, the infractions brought to light through random checking.¹⁶³ In AC products alone, it is reported that Gree obtained 21.6 million, TCL 18.3 million, Galanz 17.8 million and Changhong 1 million RMB of EE subsidy through fraudulent reporting of sales. Further, a report by CCTV, made plain that international brands such as Panasonic and LG were also guilty of subsidy fraud for EE.¹⁶⁴

Clearly, this undermined the legitimacy of giving major brands more access towards EE subsidy. Rather, the access inequality created “escape hatches” for the government’s regulatory responsibility – the major brands did not necessarily enjoy more credit in terms of obeying the EE subsidy rules and therefore could not spare government’s regulations. The negative impact of the exposed EE subsidy fraud not only involves the loss of public funds, but also the damage of public trust in EE, as well as government interventions in the market without proper public scrutiny. My three fieldtrips have shown that the villagers’ enthusiasm for government led EE programs had started as early as 2006, reached its peak in 2009, but by 2013 had cooled down greatly. Meanwhile, studies had also shown that after JDXX and JCHG, smaller and regional HA brands that used to focus on rural markets gradually lost their competitive advantages in local knowledge, contact and networks compared to

¹⁶³ See <http://companies.caixin.com/2013-06-21/100544741.html>
<http://finance.sina.com.cn/chanjing/cywx/20130814/104616443703.shtml> [last assessed 22 June 2015]

¹⁶⁴ See: <http://gz.ifeng.com/guangzhouzhuanli/jieneng/> [last assessed 22 June 2015]

the major brands that have traditionally focused on urban markets (Zhang, 2009). In addition, the 11th FYP also saw a rapid communication and infrastructure improvement in rural China that largely improved the transportation and logistics systems for HA companies to take advantage of. Major brands thus gained outright advantage to beat their local competitors in terms of both price and market penetration.

7.3.3 Evaluation

As Qi (2013) argued, the EC target responsibility system (ECTRS) that came into being in the 11th FYP established a supervision and evaluation institution by checking the effectiveness of EE target implementation. The central government decentralized the supervision and evaluation power to local governments, while it kept the power of unannounced investigation and intervention. The key element incentivising this system is the local cadres' *career promotion incentive*: meeting EE targets is essential for the evaluation of political leaders at local levels (Qi 2013, p. 29-35).

However, the National Audit Office (NAO) report on EE subsidy fraud raises serious questions about the trustworthiness of this mechanism of evaluation in the 11th FYP. Apart from HA, the report also exposed EE subsidy fraud in several major subsidised EE industrial sectors including both light and heavy industry, cement,¹⁶⁵ thermal power, and iron and steel. The NAO report was only part of the picture, because it was the result of random checking instead of regular measurement. When the report was published, half of the next FYP had already passed, and little punishment was carried out in the wake of its findings. So, why is it that the evaluation of EE policy

¹⁶⁵ See: <http://news.hexun.com/2013-06-25/155472955.html> [last assessed 22 June 2015]

was not only so late in coming, but also so lacking in powers of enforcement to follow up disappointing or non-compliant findings?

In rural China, the seemingly concrete and well-implemented ECTRS system takes place on what is in reality a loosely grounded basis. Fieldwork evidence and secondary literature reveal at least two factors leading to the evasion of responsibility in evaluation: 1. The evaluating system itself is “floating”; and 2. EE is being superseded by other priorities. Obstacles inhering to the evaluation system have served to create several “escape hatches” that allow the government not only to obscure contradictions between policy goals and between goals and implementation, but also to escape responsibility for any resultant shortcomings.

By “floating evaluation” I mean that the local evaluation of EE implementation is nominal rather than practical and reinforced by enforcement powers. The party secretary in Taiping village reported that the county government introduced EE evaluation criteria to village officials from 2011, the last year of the 11th FYP.¹⁶⁶ The evaluation consists of 100 scores, including targets for the number of LED bulbs, biogas pools, solar heaters, cleaning of public areas, etc.

“Meeting the criteria is an easy task (*haoban* 好办). LED bulbs are free; and we don’t need biogas pools, because we are going to be urbanized (*yao chengzhenhua le* 要城镇化了),” the party secretary said, “I don’t even need to count house by house. We always meet the targets. We can produce any number the county officials want. The higher authorities have policies, the localities have their counter-measures (*Shangyou Zhengce, Xiaoyou Duice* 上有政策，下有对策)... We are not worried. No one checks. The county just need a number to report to the municipal officials (*Jiaochai* 交差); the municipal officials just need the number to report to the province, and the province to the centre. The centre is too far away; it

¹⁶⁶ Previously, EE TRS was introduced to all the provincial, municipal and county level governments.

doesn't even know we exist (*Tiangao Huangdi Yuan* 天高皇帝远). Even if it knows, it doesn't care."

Xiao and Womack's (2014) investigation of the information distortion among different officials at county level and above in Guangdong province in southern China suggested that, the lower the officials' rank, the less confident he or she was in the credibility of official data. Entry-level cadres are closer to the ground than their higher-level leaders. They are responsible for reporting, and also, their political careers depend on the reported results. This conflict of interest means they are the witness and first-hand creators of the huge gap between "reality-as-perceived" and "reality-as-reported" - the gap lowers government effectiveness and generates scepticism, cynicism and alienation. The case of EE policy in rural areas seemed to confirm Xiao and Womack (2014)'s observation about the emergence of a subculture of misinformation that incentivizes the officials to provide desirable rather than factual data.

Paradoxically, unlike the officials at county level and above, officials who are appointed by the higher-level governments are bound by the target-based evaluation-promotion system. Village officials are elected by the villagers, and so theoretically, this trend towards career-incentivized misinformation should not apply to them. But in fact, "scepticism, cynicism and alienation" have indeed penetrated the EE reporting and evaluating system in rural areas. Our finding also challenges Eaton and Kostka (2014)'s conclusions on the impact of high cadre turnover on EE and environment-related policy implementation. Their fieldwork interviews with county-level and above cadres suggested that frequent cadre rotation had affected cadres' incentives and implementation capacities, which contributed to the failure of environment-

related policy implementation. Nevertheless, in both Jinhua and Taiping villages, the party secretaries have been village residents throughout their lives, thus the “roving bandit” theory¹⁶⁷ that privileges the self-maximizing and rent-seeking behavior of short-term cadres who focus on immediate and visible results rather than on the sustainability of the local community is not necessarily applicable. In addition, rural officials do not lack local knowledge or networks that may limit the implementation capacities of “roving bandits”. Both party secretaries have been in their current position for more than 8 years,¹⁶⁸ so that one cannot say that this is a case of “new lord, new laws” either.

The narrative of Taiping’s village party secretary seemed to give some clues as to the conflict between theories and rural contexts, since he clearly indicated that no one really cares about the reality behind the EE evaluation results. In 2013, the party secretary complained worryingly about implementing the relocation policy:

“The county government’s most important task to me is *Chaiqian* (demolition [for urbanization]). 70% of my time and energy is spent on this, the other 30% is occupied by the rural health care programme (*Xin’onghe* 新农合). The villagers are very difficult to deal with; they created all kinds of troubles in *Chaiqian* ... I’m afraid that my job cannot be accomplished (*Jiao Buliao Chai* 交不了差). I can’t sleep at night for all these troubles.”

Inconsistently, the same village official who did not care much about reporting manipulated EE data appeared to be anxious about failing to support urbanization. Apparently, local officials were much less motivated to realize EE compared to urbanization. It actually reflected EE’s unenviably low priority, especially compared to urbanization, in the evaluation system. In addition,

¹⁶⁷ For theory of “roving bandits/settled bandits”, also see Olson (1993, 2000).

¹⁶⁸ There is no official limit of the length of a village party secretary’s tenure. Some village party secretaries are in position as long as 4 decades. See: <http://news.qq.com/a/20130924/011405.htm> [last assessed 22 June 2015]

Nonetheless, we must ask why the village party secretary had a selective reaction to the county government's evaluation pressure - prioritizing urbanization while almost neglecting EE? Comparing the behaviour of party secretaries in Taiping with Jinhua village may give some insights. Since Jinhua village is not geographically adjacent to urban areas, the urbanization plan of Cili County had not yet reached the village. During my visit in 2013, Jinhua village party secretary was busy discussing a more sustainable plan for the demolished site of the old village brick factory. The factory was closed down in late 2009 due to its intense air pollution. Jinhua party secretary said:

“The brick factory used to be our major income source. But the pollution threatened villagers' health, and the county imposed the closure. We are not going to be urbanized, so no money will come. We have to work out something on our own (*Zi shi qi li* 自食其力).”

Obviously, the priority for environmental protection was higher on the Jinhua party secretary's task list than that of the secretary in Taiping village.

Although the county government normally does not have the power to appoint village officials, there are still inextricable connections between them. Most notably, after the “Building of a New Socialist Countryside” policy, fiscal transfers from the central government for all kinds of rural development projects have significantly increased. The budget is transferred top-down into villages through each level of government.¹⁶⁹

The urbanization project brought substantial investment to Taiping village, and consequently created rent-seeking opportunities for officials-in-charge at all levels. It

¹⁶⁹ For details of the fiscal and administrative constraints from the upper-level governments on village and township cadres, see (Oi et al., 2012) and (Smith, 2010).

effectively incentivized the village party secretary to work as an active agent to facilitate the upper level government's task for urbanization. The scale of EE investment and potential rent-seeking opportunities are not comparable to those for urbanization at all. EE is therefore further sidelined.

7.4 Discussion

Through the analysis above, a dynamic interaction between the state, the economy, EE policies and villager's everyday life emerges.

As this case study elaborates, EE is closely coupled with economic policies at every step of the policy process. This bundled relationship has enhanced the ability of rural household EE policy to garner resources and effective implementation under the framework of "Stimulus Package" and "Building a New Socialist Countryside", rather than under the context of "Energy Efficiency". But, at the same time, the pairing between development policy and EE has led to the latter's been continually pushed away from its initial and fundamental purpose: promoting Energy Efficiency.

As a result, multi-layered contradictions have developed out of the household EE policy process in rural China. The consumption-stimulus-oriented, EE, HA promotion policy encouraged the uncontrolled rise in energy demand of rural households; the EE subsidy programs excluded the poorer households and regional brands, and reinforced existing social stratification; and the new priority of urbanization has effectively sidelined EE not only on the development agenda but also in its own evaluation system. Further, all of the policy-practice zones arising from the coupled EE and economic policies, from agenda setting, and resource mobilization, to access and

effective evaluation, have sheltered, sustained and perpetuated these manifold contradictions.

Villagers' everyday life re-enforced the separation between household EE policies and their original stated purpose. The embedded relationship between EE and villagers' consumption capacities that emerged from the odd marriage of EE and economic policies have been smoothly absorbed into the existing social structure in a village. From there, a parallel hierarchy between EE and the surrounding power, wealth and family structure has effectively developed. This interaction between EE policies and everyday life has further alienated EE from its original policy goal.

Nonetheless, the analysis does not generate the conclusion that EE policy could not work in rural China. Indeed, there are successful examples of EE-related programs in the studied villages. In both Jinhua and Taiping, though the party secretary rarely mentioned this, nearly all of the interviewed households expressed praise for the "clean project in rural villages" initiative. The "Clean Project in Rural Villages" (*Nongcun Qingjie Gongcheng* 农村清洁工程) is a minor EE program that was included in the 12th FYP on Energy Conservation and Emission Reduction, which aims at pollution control and environmental improvement in rural areas.¹⁷⁰ In the two villages, every household gives 2 RMB per month to the village public cleaning funds. With the fund, the village hires people to clean the communal spaces and take care of the garbage. Even the poorest household in the village acknowledged that the 2 RMB was worthwhile, because the village is much cleaner than before, and they feel much

¹⁷⁰ See the 5th item "Developing agriculture-related pollution prevention and control" in the 3rd Section "Strengthening the reduction of major polluting sources" in Chapter Three: Major Task of Guo Fa [2012] No. 40 (State Council, 2012).

happier living in a cleaner environment. Compared to the almost 60 billion RMB of subsidies for JDXX, this “clean project” makes no financial claim on the state revenue in the studied villages. Though the two policy programs vary significantly, from contents to scale, and this chapter does not suggest that the two are directly comparable, yet, the latter has effectively achieved its original policy goal – improvement of rural environment – while the former seemed to have achieved many secondary objectives, but neglected its claimed goal – household EE in rural areas. It evidently proved that the bundling with economic policy and substantial state funding are not always necessary for EE-related policies in rural China to take root, and thrive.

China has become a world leader in EE investment after the financial crisis. The Chinese state has undoubtedly played a vital role in setting an example of government-led EE development. From 2006 to 2011, EE related expenditure as a portion of total central government’s public expenditure grew from 2.1% to 17.1% (Qi 2014, p. 51). The state’s determination and dedication in promoting EE impressed both developed and developing countries. Nevertheless, with state capital accounting for a greater and greater proportion of the total EE investment in China, the multiplier effect of government funds on social investment seems to have dramatically declined; in 2011, government funding made up 30.3% of total EE funds, higher than the 19.1% during the 11th FYP. The increasing reliance on government funds is raising questions about the sustainability of the Chinese model for EE finance and development (Qi 2014, p. 161-162). Meanwhile, household EE is thoroughly associated with the wellbeing of China’s rural population of nearly 700 million people. The market-oriented approach might have contributed to the overall EE improvement of China (Fan et al., 2007), however the relationship between the state, the economy, EE policy

and villagers' real life still demands a creative and coherent policy, especially in light of mixed results. Facing these challenges is crucial to the development not only of China's EE regime, but of EE on a global scale.

7.5 Conclusion

This chapter, together with the case study background, mapped out nuanced politics of a representative EE policy in China. The case study shows the bundling structure between the EE regime and its host governance structure in China – the economic governance – made a long-term and comprehensive impact on the detailed EE policy process. Meanwhile, the individual EE policy also played an active and effective role in reinforcing the existing bundling structure and the path-dependency formed from the previous stages.

So far, applying the five phase analytical framework that synthesized Tang's general theory of institutional change, Schaffer's framework of policy as political practice zones, and Harriss-White's non-competitive approach in China-India comparison, the thesis has worked on both the macro and micro level analysis of China and India's EE institutional change process. In the next chapter, I return to the research questions and theorize the key mechanism that emerges from my analysis.

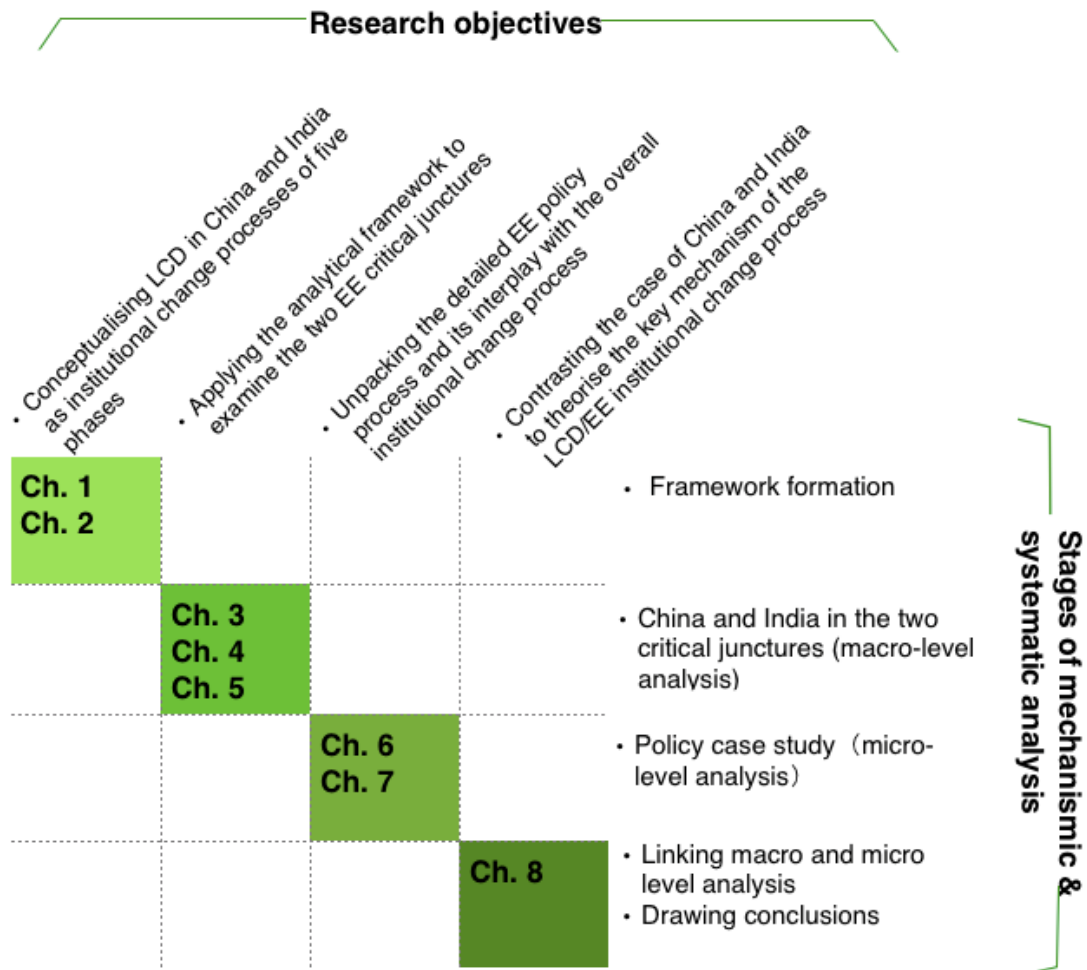
CHAPTER 8. LOOKING FOR THE KEY MECHANISM

In this chapter, I return to a discussion of the two objectives of this project: first, using a comparative perspective to examine the institutional change process of China and India's LCD trajectories during the period of late 1970s to the present day; and second, through an interdisciplinary exploration of the research topic, to construct a *cause-effect (mechanismic), systemic, and political-economic* theory of the key mechanism of LCD in contemporary China and India. I start with revisiting the rationale of the thesis, summarising findings of the empirical chapters, and linking the macro-level analysis with the case study. I then move to map out a systemic comparison of China and India's EE institutional change process through the five-phase analytical framework. It is followed by a theorization of the key mechanism emerging from the aforementioned systematic comparison – the bundling structure between the EE regime and its host governance structure. I conclude the thesis by highlighting some original contributions and by indicating future research agendas.

8.1 Revisiting the argument

Before going to the systematic comparison of the Chinese and the Indian cases and discussing key mechanisms of processes of LCD institutional change, it is worth revisiting the structure of the thesis and summarizing the empirical chapter findings.

Figure 8.1 The organizations of chapters (as same to Fig. 1.6)



The thesis is organized in four stages to serve the research objective – to examine the LCD institutional change process of contemporary China and India from a comparative perspective. The organization of the chapters aims to accomplish this investigation into *mechanistic, systematic and political economic* dimensions. In order to do this, I designed a research structure shown in Figure 8.1.

Chapter 1. Introduction, conceptualized LCD in China and India as a unique institutional change process in human history, which deserves in-depth systematic and comparative study. **Chapter 2. Theory**, draws on rich theoretical literatures of

institutional change, of the politics of policy, LCD policy/governance and China-India comparative studies to construct a synthesized analytical framework containing five phases. These are:

1. Identifying and contextualizing the triggering events,
2. Political conceptualization of the policy field for LCD,
3. Establishing LCD organizations within an existing governance structure,
4. Detailed policy process, and
5. Institutionalizing LCD.

I argue that this five-phase framework incorporates most of the approaches to institutional change that are relevant to my research topic.

Chapter 1 & 2 constitute the first part of the thesis – the formation of the framework.

Applying this framework, **Chapter 3. India and China in the first critical juncture** examines the formation of the EE regimes in China and India in a comparative way. It suggests that the first critical juncture in both China and India were triggered by urgent external and internal crises. During the first critical juncture, a self-reinforcing process between the state, the existing governance structure (economic and energy), the newly established EE organizations and actual EE policies formed in both China and India. In **Chapter 4. China in the second critical juncture** and **Chapter 5. India in the second critical juncture** the same framework is applied to analyze the institutional change process in China and India respectively during the second critical juncture. The analysis finds that the institutions formed from the first critical juncture made path-dependent impacts on the EE developments triggered by the second critical juncture. Yet under the distinctive international and domestic political economic

conditions of the second critical juncture, China and India developed different EE trajectories, underpinned by the similar mechanisms emerging from the first critical juncture.

Chapters 3, 4 and 5 form the second block of the thesis – the macro-level analysis.

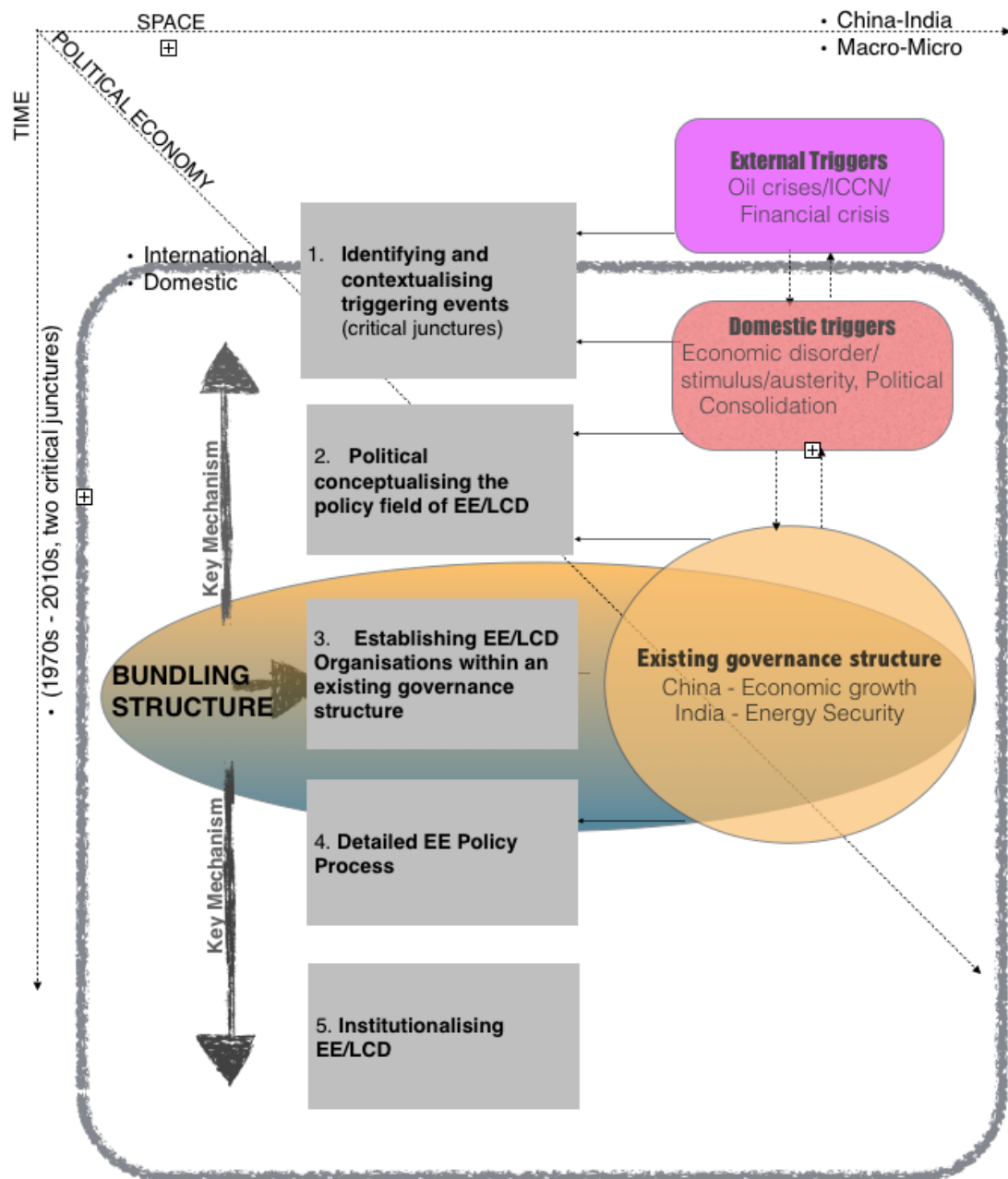
The macro-level analysis discovers that the major path-dependent influence for EE institutions comes from the host governance structure. The deeply intertwined relationship, which I call a *bundling structure* - between EE regime and the host governance - in China the latter is the structure of *economic* governance, in India it is that of *energy* governance – emerged as the key mechanism of the five-phase institutional change process. These bundling structures imprinted multiple path-dependencies from the host governance structure to the newly developed EE regime, which in turn determined the long-term impact of EE on LCD in China and India.

In order to investigate the bundling structure and its impact on detailed EE policy processes, following the macro-level analysis, the thesis moves to the case study chapters. **Chapter 6. Case study foundation** justifies China's rural EE policy in the second critical juncture as a representative EE scheme that provides an appropriate lens to unpack the manifold politics between policy processes and the bundling structure between EE regime and its host governance structure – the key mechanism of LCD institutional change. **Chapter 7. Case study result** maps out how policies act as an active agent to shape and to be shaped by the institutional environments, especially the bundling structure that emerged from the previous stages. The two

chapters contribute a nuanced micro-level analysis of the cause-effect argument of the thesis. The third step of the thesis is then complete.

The last part of the thesis tests and justifies the main findings of the empirical chapters through theorizing the key mechanisms for the EE/LCD institutional change process in contemporary China and India – the bundling structure between EE organizational regime and the host governance structure (Fig. 8.2). In **Chapter 8. Looking for the key mechanisms** I attempt to do justice to the last step of the thesis argument. Chapter 8 also recapitulates the original contribution of the thesis and suggests future research agendas.

Figure 8.2 Thesis argument



8.2 China-India comparison

After unpacking the two rounds of the institutionalization process from the late 1970s to the present day, I am in the position to map out a systematic comparison of China and India's EE institutional development and change process. The purpose of this

comparison is to recapitulate the main differences and similarities between China and India arising from the empirical analysis.

8.2.1 First critical juncture

The first critical juncture witnessed the formation of EE institutions in China and India. The distinct political and economic conditions of the two countries constituted multi-layered differences in this process; yet it reveals some similar mechanisms. This subsection first summarizes the differences, and then the similarities.

8.2.1a Differences

Phase 1. Different triggering events

In **China**, EC/EE came into the policy field in 1978-1979 because of the serious domestic energy shortage caused by the decade of economic disorder during and before the Cultural Revolution. After consolidating the political power, Deng Xiaoping, the new leader of China's first priority was to restore the domestic economic order.

In **India**, EC/EE was first brought in to the policy scope in 1973-1974 shortly after the first international oil price hike. The high dependency on oil imports and a weak economy with limited foreign reserves made India extremely vulnerable to the oil crises. The first priority of India's energy governance was to reduce the oil consumption rise through oil conservation.

Phase 2. Different conceptualization

In **China**, the paramount economic disorder enabled the government to conceptualize EC/EE through strict energy control through the existing quota system. The quota system was a long-lasting policy tool used by the Chinese government to control the distribution and consumption of food and raw materials for production especially

during the great famine 1959-1961. This institution seeps into every level of economic activity and household life in Chinese society.

In **India**, oil insecurities drove energy governance to conceptualize EE/EC as a way to combat rising oil consumption and the dangerous dependency on imported oil. Because oil was mainly consumed by the industrial sector, EE was then confined to the limited arena of industries where the market should play a central role for efficiency promotion. Despite the fact that the potential of EC/EE in agriculture and in the then rising urban household consumption was huge as well, EE was conceptualized by the state as a policy field such that it did not touch any other sector of society except market based industries.

Phase 3. Different organizational establishment

In **China**, the organizations to implement the strict EC quota system were established under the economic governance structure at national, sub-national and micro levels. During that period, other sectors of the government, including the energy and power governance were in *de facto* dysfunction. The newly established EE organizational regime took advantage of the effective economic planning and governance of the Chinese government and achieved a significant reduction of energy intensity in the 1980s and the 1990s.

In **India**, since EC/EE was seen as a problem of the market mechanism, dedicated EC/EE government agencies were not seen as necessary. All that was established was a semi-government EC promotion center under the energy governance complex in the late 1980s. Nonetheless, the continuous market failure in promoting EE in the industrial sector during the 80s and the 90s finally incentivized the establishment of

the Bureau for Energy Efficiency, a proper central government agency under the Ministry of Power. Yet, the conflicts between energy sufficiency and EE impeded an effective functioning of the EE regime under its host governance structure.

Phase 4. Different policy arrangements

In **China**, EE/EC policies focused on controlling the energy consumption at-any-cost in the 1980s. Such a unique policy arrangement was made possible thanks to the strict and effective economic planning system and the EE organizational regime established from within. In the 1990s, a more sophisticated EC policy regime was developed based on this energy consumption control and management system.

In **India**, the EE policies developed slowly and in a voluntarist way during the first critical juncture - signaled by some awareness-raising and capacity-building schemes that achieved very limited impact. Even those marginal achievements did not materialize until the 1990s, nearly two decades after EE/EC initially attracted the policy cohort's attention.

Phase 5. Different institutions

In **China**, a national target-driven EE institution was legalized by the Energy Conservation Law in 1997.

In **India**, a market-centered and no-government-subsidy EE system was stabilized by the Energy Conservation Act in 2002.

8.2.1b Similarities

Despite China and India's multiple differences in all of the five phases of the institutional change process laid out above, some common mechanisms were revealed through this investigation:

First, in both countries, EE was initially triggered by complicated international and domestic crises. Second, through processes of political negotiation led by various policy groups, EE was conceived and planned by each state to combat particularly important political and economic problems. Third, in order to realize EE, an organizational regime was formed within an existing governance structure. Fourth, detailed policy processes (which both shape and are shaped by their institutional settings) emerged from the previous stages. Finally, EE institutions were stabilized through the legalization of the first EE/EC law in each country.

These common mechanisms formed self-reinforcing processes between the five phases that together make a path-dependent impact on institutional development in each state during the second critical juncture.

8.2.2 Second critical juncture

The first decade of the 21st century witnessed the rapid economic growth in both China and India, that the growth-at-any-cost priority reduced the need for EE/LCD. Yet the escalating domestic tension between economic growth and climate change together with the international pressure pushed China and India to reflect their EE/LCD trajectories. Under such contexts, EE re-entered the policy field after 5-10 years of stagnation of development, so that the second critical juncture happened around 2006-2008 in both countries. Following the structure of the previous subsection, this discussion of the second critical juncture starts with the differences, and concludes with similarities.

8.2.2a Differences

Phase 1. Different timing of the triggering events

In both China and India, the pressure from the International Climate Change Negotiation and the sudden eruption of the international financial crisis made a huge impact on the formation and contextualization of the second critical juncture. However, a crucial difference of timing distinguished the Chinese case from the Indian one.

China started to respond to the pressure from ICCN through EE/LCD as early as 2005-2006. In 2008, after the domestic policy field of EE/LCD was well established and had been being implemented over the previous two years, the international financial crisis broke out. The global recession affected China's export market badly, which made securing the economic growth track of an export-dependent economy the top policy priority again. Thus, in the Chinese case, the ICCN and the global recession provided two triggers of its second critical juncture.

India's overall and per capita energy consumption and carbon emissions were far behind China's, so it faced much lower pressure from ICCN around 2005-6. When India had to respond to the inevitable ICCN pressure, it coincided with the international financial crisis. The fiscal austerity followed by the global recession did not give India the window of opportunity that China had had to establish an EE policy regime before the financial crisis.

Phase 2. Different conceptualizations and political alignments

In **China**, EE in the second critical juncture was conceptualized by the state to be an overarching development agenda that could help to push forward other more pertinent

political and economic agendas for the then government. Priorities were the economic adjustment and the political consolidation of key economic areas, such as mining and power generation. To serve these underlying state priorities, EE was conceptualized as an integral part of the economic development agenda.

In **India**, constrained fiscal support and the consequent policy ambivalence during the second critical juncture supported the Indian state in strengthening the conceptualization of EE as an exact market-based mechanism for promotion. Under this conceptual framework, the government's job was confined to remedying market failures. The different characteristics of the contextualization and conceptualization processes created a further distinction in EE development between India and China.

Phase 3. Different organizational development

China's EE organizational complex appeared to be both unified and dominated by the state. Since EE was conceptualized as an overarching policy scheme that embodied multiple political and economic agendas, in addition to the fact that the EE organizational regime was originally established within the effective economic governance structure, EE organizations were fully equipped to implement the targets set by the government. Nevertheless, since the EE agenda was primarily designated to accomplish other underlying agendas,¹⁷¹ the EE organizational changes that seemed to be in accordance to the change in agenda were more nominal than factual.

On the contrary, **India's** EE organizational network during this period showed strong characteristics of fragmentation and domination by non-government players. The highly constrained political and financial conditions for EE development did not

¹⁷¹ The underlying agendas include economic adjustment, regulatory consolidation and rural-urban development, which were elaborated in Chapter 4 and Chapter 6.

allow much space for the central government agency for EE, BEE, to make some organizational developments to cope with the growing EE potential. In order to remedy these resource and organizational constraints, a network of semi-government players, including influential national think tanks, environmental advocacy groups, foreign donors and industrial associations, formed an active network to navigate through the highly constrained institutional environment. They made use of all kinds of opportunities available in the system in order to realize their own agendas.

Phase 4. Different policy landscapes

China during the second critical juncture continued the characteristics of radical EE policies in terms of their scope, strictness and the amount of political, financial and social capital they successfully mobilized. However, because those radical policies were primarily serving other embodied economic and political agendas than EE, EE was *de facto* marginalized through the multi-layered politics of the policy processes.

In **India**, by contrast, the gradualist and incrementalist style of policy formed during the first critical juncture was sustained during this period. Its limited policy scope, constrained resources and fragmented organizational complex together impeded India from undertaking a bolder step to pursue EE policy in parallel with China. Nonetheless, the second critical juncture saw the birth of India's first compulsory policy scheme for heavy industries at the national level – the result of an almost ten years overdue multi-stakeholder negotiation.

8.2.2b Similarities

Phase 5. Converging institutions

The multiple differences emerging from the four stages of the second critical juncture's institutional change process consolidated the divergence between China

and India's EE organizational and policy development. However, such seemingly opposite trajectories have not necessarily led to divergent EE institutions. In fact, the second critical juncture produced more similar than different EE institutions in the two countries. Both China and India are consolidating institutions that prioritize economic growth over actual EE realization. In **China**, the economic growth priority especially after the financial crisis hijacked the EE agenda; while in **India**, the purely market-based mechanism and the highly constrained EE regime reflected the dominant growth doctrine in the EE policy landscape.

The reinforcement of common mechanisms

As in the first critical period, the second critical juncture also reveals amazingly similar mechanisms for the evolution of EE institutions. First, both of their second critical junctures were driven by complicated interactions between international and domestic events. Second, through another round of intense political competition and negotiation initiated by various policy groups, EE was conceived and planned by each state to embody not one single objective but multiple political, economic and social development goals. Third, despite the fact that EE re-entered the policy field burdened with even more additional policy responsibilities, the organizational development for EE during this period was merely nominal; the bundling structure between the EE regime and the host governance structure remained untouched. Fourth, detailed policy processes (which both shape and are shaped by their institutional settings) continued the drastic or gradualist style formed from the previous critical juncture. Finally, EE institutions are being consolidated through the self-reinforcing interactions formed from previous stages and the previous critical junctures.

8.2.3 Summary

This section shows the result of a systematic and comparative examination of China and India's EE/LCD institutional development and change process from the 1970s to the present day – fulfilling the first objective of the research project. I now move on to conclude the second research objective – to theorize the key mechanism of the EE/LCD institutional change process.

8.3 Key mechanism: the bundling structure

The common self-reinforcing mechanisms that emerged from the analysis in the empirical chapters provide spaces for some general theorization about the unique process of EE/LCD institutional development in China, India and the broader fast-growing, “emerging” world. This section brings out the main argument of the thesis – a theory of the bundling structure. I justify my *bundling structure* theory of LCD institutional change by contesting it with Harrison and Kostka's *bundling strategy* theory of mitigation policies in China and India (2013).

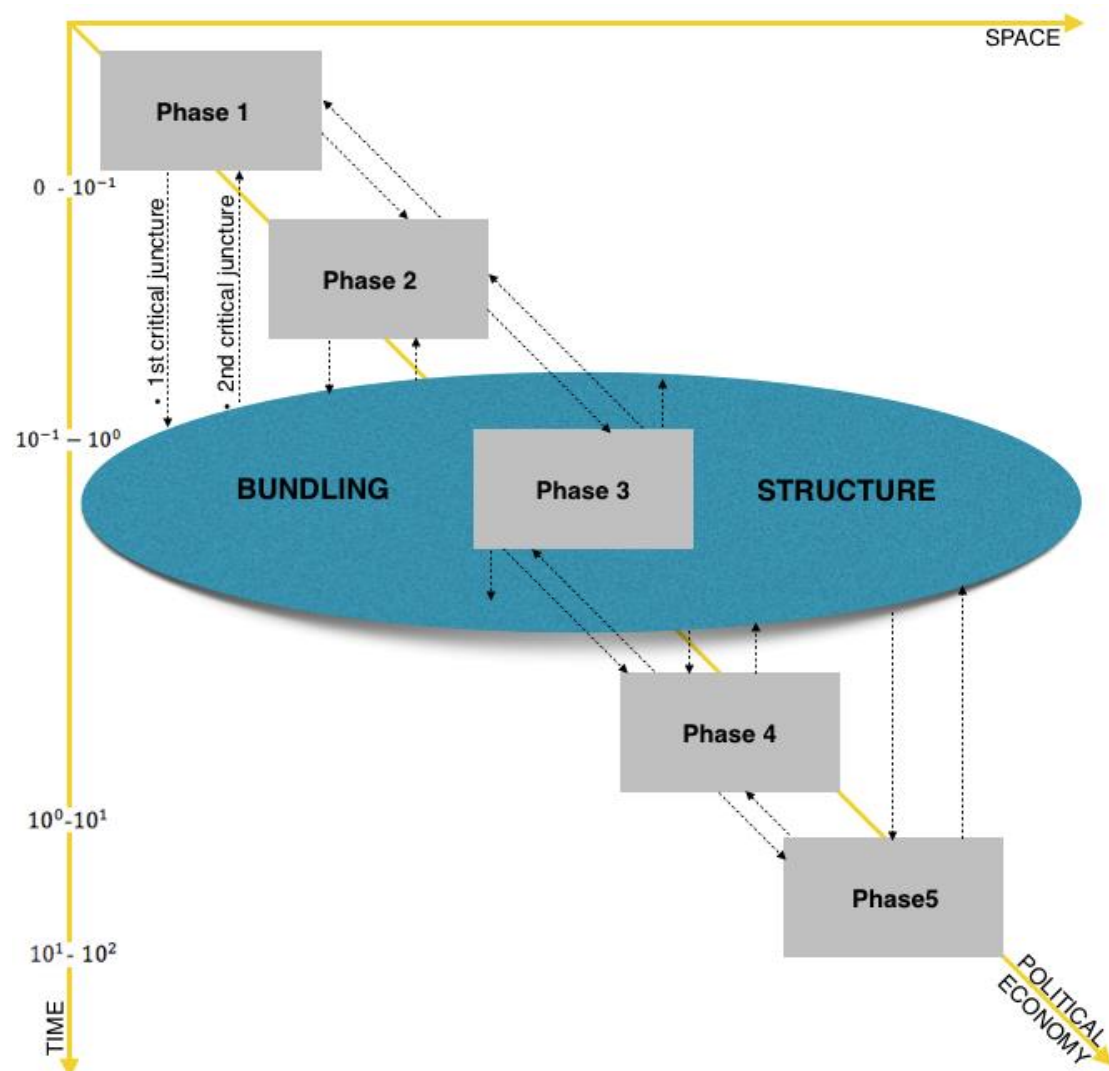
8.3.1 Theorization

By contrasting the Chinese and the Indian cases, I argue that the key mechanism of the five-phase process of institutional change is the *bundling structure* between EE organizations and the host governance structure. A bundling structure is an intertwined and inseparable relationship that is formed, sustained and evolved during the institutional change process, which fundamentally shapes the interplay between critical players in organizational and policy developments. While in China the host governance is the structure of economic governance, in India it is that of energy governance. These bundling structures imprinted multiple path-dependencies from the

host governance structure to the newly developed EE regime, which in turn determine the long-term impact of EE on LCD in China and India.

The *bundling structure* is both a result and an active shaper of the whole institutional change process. I elaborate this mutual shaping process in the five phases of the framework (Fig. 8.3):

Figure 8.3 The bundling structure



First, **the identification and the contextualization of the triggering events** for an EE development conjuncture direct the pathways of the later formation of the *bundling structure*. For example, in China, because EC/EE was brought into the policy field to combat the severe economic disorder, the first step of the institutional process was already moving EE closer to the economic growth agenda and organizational arrangement; while in India, the energy security concerns were the major motivations for EC/EE development, and consequently, the bundling structure started to form around that. On the other hand, the *bundling structure* formed from the first critical juncture made an impact on the contextualization process of the second critical juncture. In China, the bundling of EE with economic governance helped the government to perceive the ICCN and financial crisis as an opportunity for solving some urgent economic problems in the name of EE; while in India, with the energy governance structure as the host, the government was set in the pathway to bundle EE with the energy insecurity of India during the second juncture of EE development.

Second, **the political conceptualization of the EE policy field** determined the action and/or inaction for trajectories of organizational bundling in the first critical juncture; in turn, the bundling structure that developed underpinned the political conceptualization of EE in the next critical juncture. In China, the conceptualization of EE as a quota system required the state to equip EE with an effective governance structure for implementation, which was the economic planning system. The bundling structure with economic governance in the next period, enabled the government to bundle the manifold economic adjustment and growth agendas into the EE scheme. By contrast in India, it was a case of “inaction”. Since the state perceived EE mainly as a market-based mechanism, it was grouped early on into the energy governance

structure as topically relevant to, and tolerated by, the host government. This half-hearted bundling structure further disconnected EE from the other initially pertinent development agendas in India – energy security and poverty alleviation - during the second period.

Third, the phase of **organizational arrangement within existing governance structures** set the future EE/LCD organizational development on tracks within the bundling structures. In both China and India, the organizational changes at the state level in the second critical juncture were only nominal. The bundling structure formed from the previous period was reinforced, instead of being changed. Such self-reinforcing equilibrium signals the structural characteristics of the bundling relationship.

Fourth, the following **detailed policy processes** are directly determined by the bundling structure and in turn reinforced it through the complex and multi-layered politics that involve participants of the whole society. Policy processes hence became active shapers and enforcers of the underlying structural arrangements that emerged from the previous stages. The case study of China's rural EE policy shows that the bundling between EE and the economic governance structure embeds itself in the bundling relationship of all of the zones of political practice: authorisation, establishment, access and even evaluation – of the policy process. Through this continuous process, all of the policy stakeholders, ranging from rural households and local businessmen, through formal and informal networks of politicians, and manufacturers to market regulators and statistical bureaucrats, accept and operate

within the institutional environment that was and is underpinned by the bundling structure.

Finally, **the institutionalization stage** stabilizes and consolidates the bundling structure through formal legalization and informal establishment of technical sub-fields. Retrospectively, the institutionalized bundling structures generate constant path-dependent impacts on the future development of EE/LCD institutions. In China, the attachment to the EE regime within the economic governance structure was written in the Energy Conservation Law, and was later reemphasized in China's national action plan of climate change; while in India, the hosting structure between the Ministry of Power and the Bureau of Energy Efficiency was the most important relationship legalized by the Energy Conservation Act. For later on, the NAPCCC sustained this institutional arrangement.

As elaborated above, the bundling structure penetrates each level of the institutional change process, forming an inherited component in the open system of EE/LCD in China and India.

8.3.2 Time, space and political economy

The other layer of my bundling structure theory is the three-dimensional context of time, space, and political economy, in which the bundling structure for EE was formed and has evolved (shown in Fig. 8.3). The crucial mechanism of EE/LCD development in large and complex developing countries with fast economic growth cannot be fully understood without taking into consideration the specific dimensions of time, space, and political economy as well as their inter-connections.

Following my first theorizing effort in Chapter 3 (Fig. 3.3), the scales on the time dimension in Fig. 8.3 attempt to indicate the time range of the various stages of LCD -

Phase 1: The breakout of the triggering events, either due to cumulative effects or sudden causes, usually happens in a short period of time. Accordingly, within each country the creation of an institutional context for those triggers takes place as soon as possible. So the time scale of the first phase is less than a year, which is shown as a time frame of **0 - 10^{-1} year** on the top of the time dimension in Fig. 8.3.

Phase 2: The process of political competition and negotiation for the conceptualization of EE/LCD in the policy field (the struggle for rulemaking that can benefit specific policy group[s]) takes a longer period of time than the contextualization process that happened immediately after the breakout of triggering events. Yet this phase usually finishes within a year, which is shown as a time frame of **$10^{-1} - 10^0$ years** - the second from the top of the time dimension in Fig. 8.3.

Phase 3 and Phase 4: following the organizational establishment and the detailed policy processes, even more intense and broader political and economic negotiations and competition develop for the realization of EE/LCD and the multiple policy agendas being bundled with it. Establishing one organization might take less than a year, yet the formation of an organizational complex for EE/LCD takes a few years. Some long-lasting policy process require more than ten years, such as the decade long negotiation for the launch of PAT, India's first national compulsory industrial EE policy scheme. But the majority of the policies remain in effect for a few years' time

in the fast changing political landscapes of China and India. Therefore, this period is shown as a time frame of **10^0 - 10^1 years** on Fig. 8.3.

Phase 5: once institutions have stabilized, they become the rules of the game that structure all layers of the interplay between stakeholders and the future institutional developments. They generate path-dependent impacts for periods of time that are usually longer than ten years. Since I do not touch the domain of social embeddedness in institutional theory (i.e. the roles of religion, social concepts and norms) in my study, the institutions under this framework are unlikely to last for more than a century. Thus, this phase of development is shown as a time frame of **10^1 - 10^2 years** (the last time scale on the time dimension in Fig. 8.3).

8.3.3 Validation

In this sub-section, I contrast my *bundling structure* theory with the *bundling strategy* theory proposed by Harrison and Kostka (2013), which remains the other most compelling comparative theory of climate change policy in contemporary China and India today.

Through a collaborative and comparative exploration of China and India's energy efficiency policies, Harrison and Kostka found that "the implementation of mitigation strategies is far from straightforward. It requires careful balancing of competing priorities and deliberate strategies to bring different interest groups on board" (p.1). They argued, "the state plays a central role in building the support base for its policies through processes that [we] describe as the bundling of policies and interests" (p.1). The two kinds of strategies – policy-bundling and interest-bundling – are the *bundling*

strategies this study focused on to unpack and theorize. In brief, the bundling strategy in Harrison and Kostka (2013) refers to the formal and informal coalition formed between the social elites, including bureaucrats, technocrats and businessman, in order to implement mitigation targets.

Harrison and Kostka (2013) insightfully observe that despite the different approaches towards EE adopted by the Chinese and Indian governments – “state-signaling” in the case of China, and “market-plus” in that of India – they both used similar bundling strategies to implement the mitigation target. In other words, the mechanism of the implementation strategy is similar in the two cases. They argue that the bundling strategy enabled the two governments to utilize the existing organizational arrangements and resource availabilities to realize the climate change goals. My empirical research resonates with this argument.

Yet despite this agreement, my *bundling structure* theory is profoundly different from the *bundling strategy* theory of Harrison and Kostka (2013) in the following three ways.

First, a *strategy* is in nature a temporary political tool being cultivated and labored by the state and social elites to realize a common policy goal. A strategy can be adopted, shifted and/or abandoned according to the relatively short-term political and economic needs of the leading policy agents. Yet a *structure* is a mechanism that fundamentally shapes the interplay of all players; it is an inherited component of the “rules of the game”. Moreover, a *structure* generates long-term path-dependent impacts on future development that cannot be remedied without essential “structural” changes. In the

case of EE, the bundling between economic growth and EE policies in China, and the bundling of interests between energy security and EE that Harrison and Kostka (2013) observed are products of the long-lasting bundling structure between EE and its host governance structure in each country, which are more deeply rooted than a transitory policy strategy.

Second, a *strategy* can be a bottom-up response to the pertinent policy challenges. In Harrison and Kostka, those responsive strategies are described through the forms of various kinds of informal alignments and local manoeuvres. Meanwhile, a *structure* is the underlying mechanism that emerged from intense and fierce political competition involving the whole range of policy engagements, including both the top-down policy-shaping process and the bottom-up reactions. My research not only addresses the local politics of EE policy process through in-depth fieldwork, but it also stresses the importance of the process of political negotiation taking place at the top level. The latter also sometimes provides distinctive and valuable perspectives on the bottom-up process of institutional and policy development. Through archiving, interviewing and observing the top-level policymaking, as well as synthesizing both the top-down and bottom-up angles, I push the argument one step further towards the more fundamental structures of the various bundling strategies pointed out by Harrison and Kostka (2013).

Third, a *strategy* is useful to understand a specific policy field in a certain period of time, but it lacks the explanatory power in face of the regularity of a process of continuous institutional formation and change. A *structure* incorporates multi-dimensional political and economic influences over a longer period of history, which

attempts to capture the cause-effect characteristics of an open system. In my research field, the policy and interest-bundling theory does not touch the early period when the manifold path-dependencies of EE development originally coalesced. My research extends the time scope to discuss in-depth *the origins of EE institutions and their impact on the future of EE/LCD in China and India*. For instance, the *bundling strategy* theory finds that EE aligned with economic policies during the 11th FYP of China, yet it does not explain why and how this policy alignment was made possible. Responding to that question, the *bundling structure* theory argues that since China's EE regime started with and settled within the economic governance system, EE gained a structural advantage in being “bundled with” the economic agenda from the start.

8.3.4 Summary

So far I have demonstrated the key mechanism rose from my comparative study through a systematic theorization and a thorough contestation with the best alternative theory. I thus responded to the second research objective of the project – to construct a cause-effect, systemic and political economic theory of the key mechanism of EE/LCD institutional development and change process in China and India. I now move on to the concluding remarks of the thesis

8.4 Concluding remarks

Situated at the intersection of the literatures in institutional change, policy and governance studies, LCD, and multi-disciplinary China-India comparative studies, the original contributions of my project are threefold:

First, this project is one of the first systematic scholarly attempts to make sense of LCD in large and complex countries with fast economic growth by using the perspective of institutional change. Previous studies have addressed the problems of LCD from the perspectives of technological, market failure, financial investment, and socio-economic and lifestyle changes. My thesis presents the argument that the foundations for making factor-based changes are the formation and development of institutions. I argue that China and India's transition towards a low-carbon economy is an unprecedented policy practice in human society that deserves separate and comparative academic research.

Second, drawing on broad theoretical resources and through an interdisciplinary exploration, the thesis tries to construct a *cause-effect*, *systemic*, and *political-economic* framework of the key mechanisms that emerged from the process of EE/LCD institutional change in contemporary China and India. I argue that despite the manifold differences in political, economic and social contexts in contemporary China and India, the process of institutional development and change in EE reveals some similar mechanisms, in which, the bundling structure between EE regime and a host governance structure was the key nexus for understanding the success or failure of this process.

Third, my comparative framework adds a systemic and nuanced methodological viewpoint to the emerging field of multidisciplinary China-India comparative scholarship. Located within the “non-competitive methodological approach” within China-India comparative studies, I argue that China-India comparison should go beyond the focus of different development pathways. The common and fundamental

mechanisms of LCD and broader development areas emerging from this rigorous China-India comparison would enable us to make sense of the distinctive development stages of the “emerging world” more generally.

The empirical and theoretical results of this project suggest that more effective EE policies require substantial institutional changes in China and India. Yet without effectively breaking the positive feedback-loop of the self-reinforcing process of the bundling structure between EE key regime and the host governance structure, the institutions of EE development in the two countries will remain untouched. This partly explains the continuous policy failures in EE development in the two most crucially important actors for global energy and climate scenarios in the developing world.

Today, with climate change entering the center of the world’s political and economic agenda, China and India’s low-carbon transitions have become crucial to the success or failure of global sustainable development. The findings of this study, on the one hand, help us better understand the common low-carbon mechanisms of the two most important emerging countries; on the other, its on-the-ground evidence makes a strong case for international policymakers to address the path-dependent influences of the existing governance structures on LCD.

In my future research, I would move on to explore the technological, policy and governance tools that can help to bring fundamental changes to the institutions in China and India. In addition, I would like to test and to improve my theoretical framework by exploring wider LCD arenas than EE, such as the unconventional

energies and energy security, and by applying it in the wider developing world beyond China and India.

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