The Contribution of Domestic Economic Processes to China's Commitment to the Paris Agreement

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Keystrokes: 149575

"The Nation that Leads in Clean Energy Will Lead the Global Economy"

- **Obama, Barack (2009)**

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Abstract

The current domestic economic processes of China are steered by a green growth rationality in which considerations of environmental sustainability are paired with concerns of upholding economic growth. This green growth rationality has led the Chinese leadership to make massive investments and increase its R&D spending within the renewable energy sector. These investments are conducive to both climate change mitigation through increased renewable energy production and for the continued economic development of China through innovation and exports of renewable energy products. The domestic economic processes have contributed to the Chinese commitment to the Paris Agreement, as the agreement itself is built on the concept of nationally determined contributions. This essentially means that any contribution to the agreement by China is in alignment with its domestic interests, and consequently an extension of it.

The domestic economic processes do not exist in a vacuum but are bounded by the environment in which they occur. That is, domestic processes are always shaped by the system in which they unfold. For China this means that its main interest of economic growth is currently shaped by the forces of climate change. This systemic change represents threats as well as opportunities for the continued economic growth of China. The threats originate from global warming. These are multidimensional and include environmental, social, and economic distress, which all have the potential to cause social unrest. Therefore, climate change represents a threat to the safeguarding of China's Communist Party's legitimacy and thereby its continued ability to effectively rule the People's Republic of China. On the other hand, the opportunities present within the context of climate change, is typified by the current response to these threats, which is a global transition towards a green economy. This is an economy which, in accordance with the concept of green growth, accommodate both environmental and economic concerns.

The stimuli present at the system level have prompt the Chinese leadership to make green investments within the renewable energy sector. These investments are currently very successful, which speaks to the endurability of the domestic economic processes. Therefore, China will seemingly continue to pursue economic growth through innovation in sectors which can accommodate environmental concerns, such as renewable energy.

It can be expected that China remains committed to the Paris Agreement, as the Chinese

commitment to international cooperation on climate change is in alignment with its national interest, and its current domestic economic processes. However, this necessarily means that China's commitment to the Paris Agreement is contingent on China's green investments and whether these investments produce outcomes conducive to climate change mitigation, and most importantly – to economic growth. From a global perspective, China has developed in a positive direction regarding climate change mitigation. However, China will not make any international pledges beyond its domestic targets, and thus China's commitment to the Paris Agreement will always remain a mirror image of its domestic economic processes.

Introduction

The rise of China has been followed intensively by observers around the world and continues to do so because of the many changes the rise has signified both within China and in international politics and economics. During the last four decades China has experienced tremendous growth but at a cost. The rapid economic growth fueled by its transformation from a centrally planned agrarian economy to a market-based industrial society has taken its toll on the environment. Ninety-seven percent of leading climate scientists agree that the current climate changes are mainly due to human activity, most notably the emission of greenhouse gasses, which China in its course towards great power status has become the world's leading emitter of. This represents a challenge since China quite naturally will continue to pursue economic growth to sustain its development path and maintain internal stability.

The emission of greenhouse gasses has led to climate changes of which the main characteristic is global warming. The consequences of global warming include melting polar ice caps and glaciers, rising sea levels, growing number of extreme weather events, and increased air pollution (EDF, n.d.). These direct environmental consequences of climate change are accompanied by social and economic distress for all societies. Therefore, climate change represents one of the biggest challenges of the twenty-first century for all the states in the international system. The active fight to mitigate the negative consequences of climate change has, however, also been characterized by a slow but steady global economic transition towards green growth, which is considered to be economic growth that also ensures the sustainability of natural resources on which the economic growth relies (OECD, 2017). From the transition towards green growth, new markets, such as the renewable energy sector, arises. Climate change can therefore be conceptualized as a systemic change, which consists of both economic threats and opportunities. This perspective underpins the research undertaken throughout the thesis.

Climate change is in popular discourse and in politics mainly dealt with as a global problem. Accordingly, from this perspective, climate change is seen as a problem not only to China but to all the world and therefore to understand what motivates possibly the most important actor in the fight against climate change should be a critical task to both scholars and policy-makers who are interested in climate change mitigation by limiting carbon dioxide emissions.

Since the climate change negotiations in 2009 in Copenhagen (COP 15), China has frequently been criticized for its uncooperative role and been portrayed as the causing factor for the breakdown of negotiations. Nevertheless, in 2015 at the Conference of the Parties (COP 21) under the UN Framework Convention on Climate Change (UNFCCC), 196 Parties, including important great powers such as China and the United States which respectively account for about 28% and 15% of all CO2 emissions globally, came to a global climate change agreement (UCS, 2018). The agreement has since been known as the Paris Agreement and is considered a milestone within global cooperation on the adaptation and mitigation of climate change.

The Paris Agreement lays out a framework with the aim of limiting global warming to 2 degrees Celsius above pre-industrial levels and preferably below 1.5 degrees. To achieve this goal, the Paris Agreement sets out binding commitments for all Parties to prepare, communicate and maintain. These commitments are known as nationally determined contributions (NDCs) and shall be uphold by domestic measures to limit the emission of greenhouse gasses (GHG). In addition, the NDCs shall be communicated every 5 years with new and more ambitious commitments successively taking over from the previous NDCs (UNFCCC, n.d.).

China ratified the Paris Agreement on the 3rd of September 2016 and the current policy projections of China show that it will reach both its 2020 pledges and 2030 pledges, and quite possibly exceed the targets set out in its NDC (CAT, 2018). The United States, on the contrary, under the guidance of the Trump administration, has decided to opt out of the Paris Agreement, which begs the question of what national circumstances have led to this variance in foreign policy behavior. As mentioned, China will presumably continue to pursue economic growth to sustain development and maintain stability. Therefore, it is assumed throughout the dissertation that the economic growth imperative must also serve as the basis for China's engagement in global climate change mitigation, and that foreign policy is always to some degree an extension of domestic politics. Thus, it is asserted that for China to address the existing threats and opportunities within the context of climate change, the Chinese Communist Party is prompt to make green investments, such as investments within renewable energy. This is based on the notion that "[t]he use of renewable energy sources and of low-carbon fuel technologies plays an important role in addressing climate change" (OECD, 2017: 38). In addition, the renewable energy sector also represents an avenue for unlocking opportunities of innovation and exports, which are paramount for the sustained economic development of China. Renewable energy thus embodies the essence of green growth with its attention to environmental sustainable economic growth. Against this backdrop, the main research question of the thesis is:

"Why and how are domestic economic processes conducive to China's commitment to the Paris Agreement?".

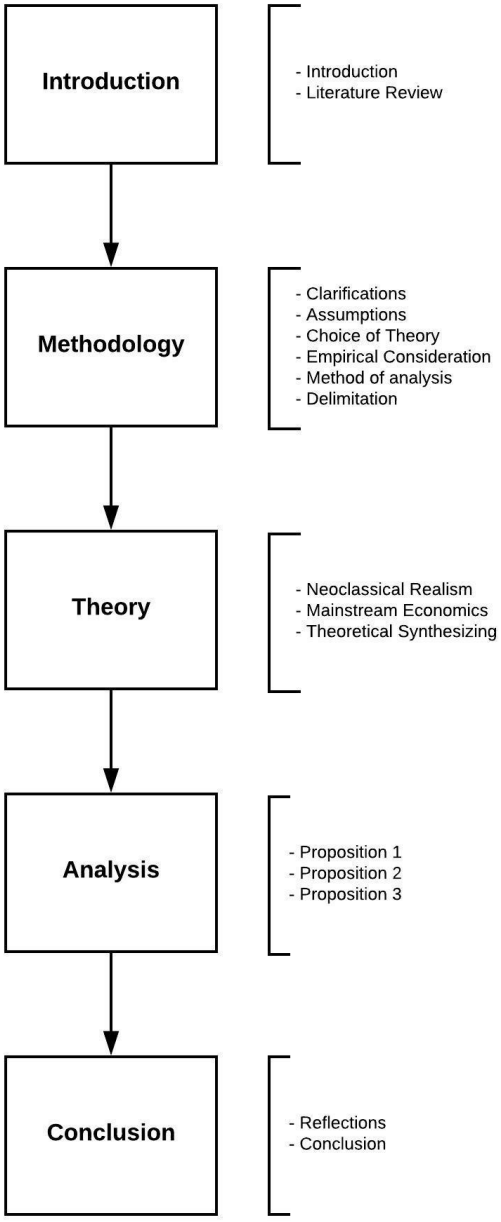

Fig. 1.a Thesis diagram - overview

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1.1 Literature Review

The main research question positions itself within a broader discussion of whether the current global economic structure can even accommodate ecological considerations. This debate is accordingly divided between orthodox and heterodox scholars. The division can be captured by the notion of two types of theories presented by Robert Cox in his canonical essay *Social Forces, States and World Orders: Beyond International Relations Theory*, that is, problem-solving theory and critical theory, the purposes of which, respectively, are to either solve problems in the world as it is or to question the current structures that governs actions and power relations (Cox, 1981). Within this dichotomy, most scholars, hence the designation orthodox, are situated in the problem-solving camp. However, others such as Li Minqi (2014: 176) does not see any feasible solutions to the challenges of climate change within the current global economic structure and thus consider it necessary to move from the capitalist world system to socialism to achieve ecological sustainability. This thesis, however, is placed within the problem-solving paradigm as it "takes the world as it finds it, with the prevailing social and power relationships and the institutions into which they are organized, as the given framework of action" (Cox, 1981: 128). That is, the research question of 'why China's domestic economic processes are conducive to its commitment to the Paris Agreement?' does not question the legitimacy of either the domestic economic processes or the institution in which the Paris Agreement has been shaped, but rather accept these entities as natural and from this starting point attempts to analyze the origins, the functioning, and the outcome of these units of interest. The literature on China and its commitment to climate change cooperation that share this problem-solving approach are nonetheless varied and reflect a broad range of theoretical approaches and diversified study variables, and consequently focal points of investigation.

In general, the works concerned with the current state of Chinese climate change cooperation and grounded in the problem-solving approach can roughly be separated into three groupings. The first group consists of studies that emphasize factors conducive to the comprehension of the Chinese engagement. In other words, these studies emphasize the *why* and are thus concerned with the interests, preferences, and drivers behind Chinese climate change action. The second group is made up by research which main purpose is to evaluate this engagement in terms of effect vis-á-vis the goals set forth in the Paris Agreement. Consequently, the second group also include research highlighting normative aspects, such as who bears the responsibility of climate change. The third group is concerned with the machineries of the institutional setting in which climate change negotiations takes place. Consequently, the third group only peripherally cover the Chinese aspect.

Zhang (2017) contemplates whether China's commitment to the Paris Agreement can be considered sufficiently ambitious, and thus positions itself within the second group. Keohane & Victor examine how international cooperation on climate change can be enhanced. Their focal point is different types of international collaboration which can be categorized in terms of the depth of cooperation. Consequently, their research is not limited to the case of China but has wider scope and can accordingly be placed firmly within the third grouping. Albeit, their work is focused on improving the institutional setting of climate change cooperation, Keohane & Victor point out that their analysis omits an important feature of climate change negotiation, which is domestic politics (Keohane & Victor, 2016: 571). Thus, while their research studies cooperation, it nevertheless acknowledges that domestic politics has a role to play for international negotiations besides the setting in which cooperation takes place. Their analysis also points out five different interests vested in the national pledges, which the Paris Agreement is contingent on. These different interests are as follows: (1) create the global public good of reduced climate change; (2) create local or national public goods that happen to address as well, the global public good of climate change; (3) generate competitive economic benefits, such as the creation of new industries – solar, wind, batteries; (4) bargain for side-payments, such as requests for money to help pay the cost of controlling emissions and adapting to climate change; (5) create reputational benefits (Keohane & Victor, 2016: 573). These five different categories of incentives denote a range of interests which for some are vested in domestic affairs while others are motivated by international aspirations. This illustrates the wide-ranging factors emphasized within the literature belonging to the first group.

The bulk of studies motivated by the objective to examine the drivers behind China's commitment to climate change cooperation is concerned with interests either belonging to category 2, 3, or 5 – or several in combination. Godbole (2016) identifies three main drivers for China's climate change cooperation commitment. That is, domestic environmental challenges, the search for international leadership position, and the bilateral US-China climate change cooperation. Thus, Godbole positions himself firmly within preferences of type two and five by stressing environmental concerns and international leadership position which essentially is about creating national public goods and reputational benefits, respectively. The last point emphasized by Godbole reflects both type of incentives. Following the logic of environmental concern, several authors highlight China's domestic challenges with air pollution as the main driver for climate change action, and thus places themselves exclusively in category two (Li, 2016; Stensdal, 2015). Containing a different perspective, Kopra (2012) draws attention to China's image-building through its climate change diplomacy, and

consequently situates her work in class five. Gao (2016) also stresses the importance of China's ecological considerations and socioeconomic transformation to understand its climate change commitments, thus locating his work in category two and three. Both Hilton & Kerr (2017) and Kwon & Hanlon (2016) underline economic concerns to explain climate change action and are therefore situated in group two. Kwon & Hanlon conclude that economic growth is the core interests and driver behind Chinese climate change action. While Hilton & Kerr emphasize the role of the change in Chinese policy characterized by its shift to a 'new normal' model of economic development.

The scholarly literature revolving around China's commitment to climate change cooperation denotes a varied list of perspectives on the drivers of Chinese engagement. These analyses are, however, not mutually exclusive and must therefore not be perceived purely as competing theories of Chinese climate change engagement. The different analyses complement each other to illuminate complex social reality. A reality in which, policies are made on the grounds of many multifaceted incentives. Nevertheless, while different factors surely work together in configuration to produce a certain outcome, some factors are primary while others remain epiphenomenal.

The research question dealt with here implicitly implies that domestic economic factors have a direct causative role that explains China's commitment to the Paris Agreement and that other internal and external interests therefore remain epiphenomenal at best. However, the emphasized domestic economic processes are economic mechanisms prompted by systemic stimuli, which is characterized by both threats and opportunities. Therefore, are these domestic economic processes grounded in a green growth rationality concerned with both ecological considerations and economic growth. Consequently, the thesis places itself within category two and three, which means that the interests presumed to have directed Chinese commitment to the Paris Agreement are characterized by the creation of national public goods that happen to address the global public good as well, and in addition, to create competitive economic benefits. More specifically, national public goods is through environmental considerations which, however, is driven by economic incentives while the competitive economic benefits are industries with economic potential but without causing further damage to the environment. Thus, the two interests are connected through a green growth rationality.

Methodology

The main research question is: ***Why and how are China's domestic economic processes conducive to its commitment to the Paris Agreement?*** To answer this question three propositions are put forward. Each proposition is guided by one of two distinctive theoretical frameworks, or both, which in agreement with the proposition explain either domestic economic processes or linkages between systemic incentives, domestic processes, and foreign policy outcome. This utilization of theory in this way consequently means that the research design is based on a deductive approach.

Since the main purpose of the thesis is to explain why the domestic economic processes of China has contributed to its commitment to the Paris Agreement, the thesis can rightfully be considered an explanatory case study. The main research question asserts that the explanation of the Chinese commitment to the Paris Agreement is best understood through the economic dimension of Chinese politics. Accordingly, the inherent perspective of the thesis regards China's foreign policy as an extension of its domestic economic policies.

A qualitative case study approach is applied which provides the tools to get a detailed understanding of the Chinese' domestic economic interests and perceptions. This approach allows for a holistic and eclectic study that utilizes diversified data that consist of both quantitative, qualitative, primary and secondary sources. The inclusion of different types of data leads to robust research that allows for a wide-ranging and in-depth investigation of a subject (Zainal, 2007). Furthermore, Blatter & Haverland (2014: 6) argue that "case studies are superior to large-N studies in helping the researcher to understand the perceptions and motivations of important actors and to trace the processes by which these cognitive factors form and change". The case study methodology is thus an optimal approach because the research agenda for this dissertation essentially revolves around China's motivations and perceptions in relation to climate change mitigation and cooperation.

A case study can be defined as "an intensive study of a single unit for the purpose of understanding a larger class of (similar) units" (Gerring 2004: 342). However, the aim for this study is primarily limited to ideographic purposes, as opposed to nomothetic concerns, and does therefore not purport to generalize in terms of the larger population on behalf of this research.

The research undertaken here is a single-unit study in the sense that it only takes China as a case when confronted with the task of explaining the commitment to the Paris Agreement, which

have been signed and ratified by almost two hundred Parties. Zainal (2007) states that a single-case design can be utilized when events are limited to a single occurrence. Thus, while the agreement has been ratified by several parties, the event of interest, that is, specifically China's signing and ratification of the agreement. The choice of China as the case of interest is predominantly because of China's growing importance regarding global climate change mitigation which first and foremost is due to its notorious title as the world's biggest emitter of greenhouse gasses and its position as a developing country.

2.1 Clarifications

To avoid misunderstandings, one basic clarification needs mentioning. That is, China is in this research understood as a unified actor that principally consists of a top leadership that directs China's actions in relation to both domestic economic policy matters and in foreign relations. China is consequently throughout the thesis termed China, the Chinese state, the Chinese government or the Chinese Communist Party (CCP). These different entities are not the same but due to China's one-party system and the supreme role of the CCP in the Chinese society, these designations are used interchangeably. As Francois et al. (2016: 2) explains: "[a]s the regime party of the People's Republic of China (PRC), the CCP is, de jure and de facto, the be-all and end-all of political activity in the second largest economy and the most populous country in the world today". That is, the CCP is dominant in all governance structures of the PRC. Therefore, can it be justified to use these labels interchangeably when referring to the decision-makers of China. This in turn also indicates the state-centric perspective of the research.

2.2 Assumptions

Several basic assumptions underpin the research undertaken for this thesis. Gerring (2005: 179) argues: "no causal argument of any sort (indeed, no argument of any sort) could be made without assuming a good deal about how the world works". Based on a similar assessment of the merits of a good argument, these assumptions fortify the propositions offered throughout the dissertation

The first assumption is that foreign policy is always to some degree an extension of domestic politics, which consequently serve as a basic premise for this thesis. In the same vein, Kissinger (1966: 503) explains that "[t]he domestic structure is taken as a given; foreign policy begins where

domestic policy ends". For that reason, is it of primary concern to evaluate the domestic processes which consequently serve as the foundation on which foreign policy is laid.

The second assumption is that states in international relations act according to self-interests, which basically means that states will promote advantages for themselves without regard for others. This does, however, not mean that actions taken in the name of self-interests cannot be beneficial to others. As Kitchen (2010: 126) claims "states may do justice to wider interests than their own, while they pursue their own" and in the same vein Heffron (2015: 15) reasons in the context of climate change mitigation that "the most rational and self-interested policy could be to align with other states and take collective action". Thus, while self-interests always indicate gains for the actor pursuing its own interests, this does not necessarily translate into losses for every other actor, and at least not in every domain – whether that be in economics, security or of environmental concern.

The third assumption is that economic growth is the primary concern of the CCP. In a white paper published in 2011, it states that "China is firm in upholding its core interests which include the following: […] China's political system established by the Constitution and overall social stability, and the basic safeguards for ensuring sustainable economic and social development" (State Council, 2011). In accordance, the Chinese Communist Party pursues economic growth for two main reasons. First and foremost, to ensure its legitimacy and thus maintaining stability within the country which ultimately is a requirement for the continuation of providing economic growth and any other functioning of government for that matter. Yu (2018: 225) argues that "no discussion of major Chinese policy can ignore the ultimate aim of the Chinese Communist Party (CCP): staying in power and keeping absolute control. This requires stability and in turn requires the CCP keep its 'social contract' with ordinary Chinese people of growth and employment". This quote illustrates a simple point, that is, the CCP will remain the legitimate ruler of the People's Republic of China as long as they provide economic development to the country. The second reason for the CCP to seek economic growth is simply to sustain its development path which both advances China domestically but also improves its position internationally.

The last assumption that needs to be mentioned is the recognition that other domestic and systemic factors can be and probably are conducive to understanding the Chinese commitment to the Paris Agreement. The domestic economic factors emphasized throughout the thesis are, however, believed to be preeminent while others, such as international image, citizen's health, and environmental morality are believed to be auxiliary interests of the Chinese government at best.

2.3 Choice of Theory and Propositions

The main research question: *Why are domestic economic processes conducive to China's commitment to the Paris Agreement?* is answered by assessing three unique propositions:

P1: Systemic stimuli prompt the Chinese leadership to make green investments

P2: Green Investments generate green outcomes

P3: These domestic economic processes have strengthened China's commitment to the Paris Agreement

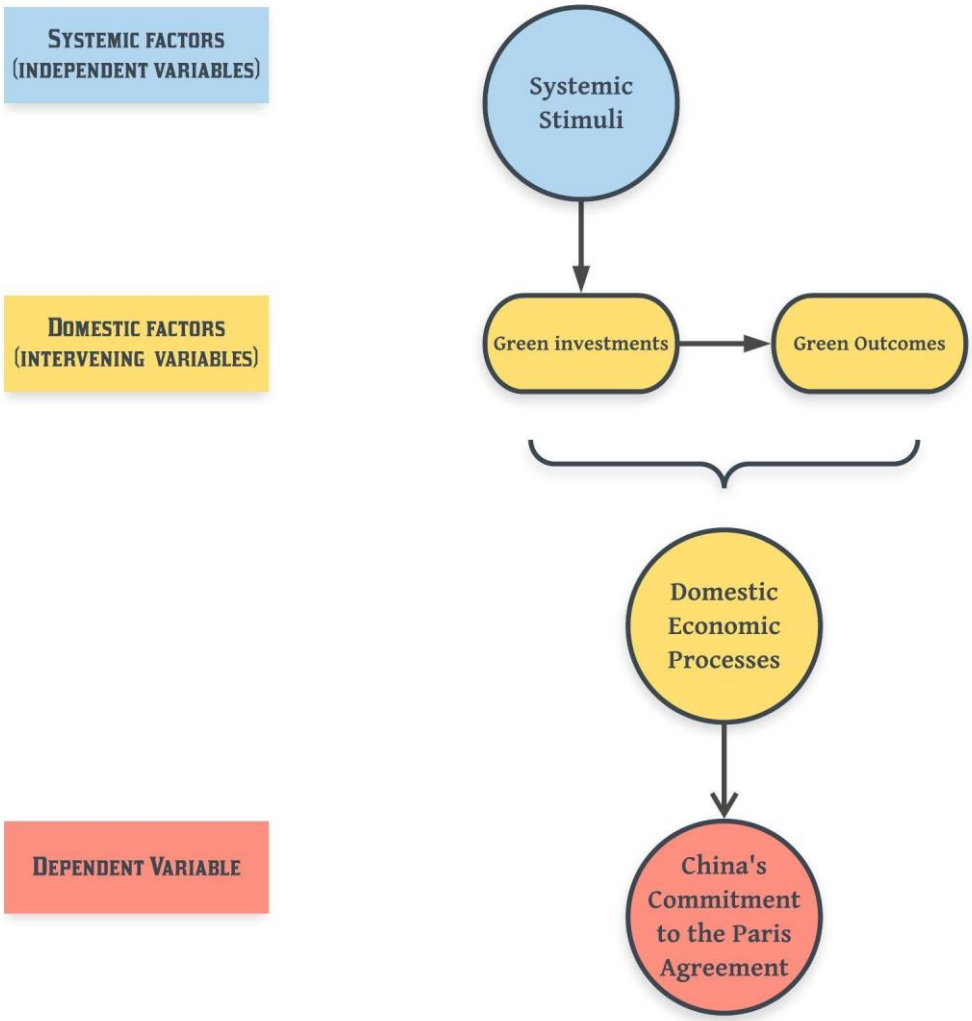

Fig. 2.a Explanatory model/conceptual framework: Conjectured relationship between systemic stimuli, domestic economic processes, and China's commitment to the Paris Agreement

Source: Compiled by author

These three propositions are intricately linked to answering the main research question and to the theories that explain them. The first proposition links systemic stimuli to domestic economic processes, and thus entails how the domestic economic processes are initiated. The second proposition comprises of the domestic economic processes. While the last proposition links the domestic economic processes to the outcome, that is, China's commitment to the Paris Agreement.

The aim of the thesis is to examine the ongoing domestic economic processes within China. That is, how these processes have started, how they are proceeding, and assess the relationship between the domestic economic processes and China's commitment to the Paris Agreement. The domestic economic processes are believed to have been instigated by systemic incentives within the context of climate change. Therefore, two incentives are conjectured – one in relation to the threats posed by climate change and one in relation to the economic opportunities which have arisen due to climate change. Both are, however, linked to the aim of securing economic growth and are therefore based on the same rationality and theoretical framework. Accordingly, both enticements are also expected to produce the same outcome. In this case, the expected outcome is green investments which for this study denote overall investments and R&D spending within renewable energy. This is based on the notion that "[a]ny pathway towards safe levels of GHG emissions includes the more widespread use and further technological advancement of renewable energy technologies" (Gosens & Lu, 2013: 234). Renewable energy tackles the threat incentive through mitigation while seizing the opportunity incentive through innovation and exports.

Turning to the explanatory model presented above. It is assumed that if the opportunities and threats are significantly present and are being perceived this way by the Chinese government, and that the Chinese government are sufficiently vulnerable to the threats and has the sufficient ability to seize the opportunities present under climate change, then it should follow that systemic stimuli prompt the Chinese government to seize said opportunity by investing in renewable energy and increase the R&D spending which not only tackles the negative economic consequences of climate change but also sustains the continued economic development of China. Green investments are assumed to cause green outcomes, which are typified by results that either possess characteristics conducive to mitigation or innovation. This domestic economic mechanism is, in turn, conceived as having strengthened the Chinese commitment to the Paris Agreement.

To clarify the answers to the three propositions two theoretical frameworks are utilized. One to explain the linkages between the different levels of analysis and the main assumptions of political actors, and another theory to explain the domestic economic processes which are assumed to have

strengthened China's commitment to climate change mitigation, and consequently to the Paris Agreement. The two distinctive theoretical frameworks have thus jointly served as the underlying framework which supports the propositions put forward by the author. These propositions have, consciously and subconsciously, been derived from the underlying frameworks in connection with the subject matter. Theory has, however, not only been used to generate predictions but is explicitly applied to explain observations. The utilization of two distinctively different theories illustrates the eclectic approach undertaken throughout research.

To explain levels-of-analysis-linkages, the neoclassical realist conception of the relationship between systemic incentives, domestic factors, and foreign policy outcome, is applied. This theoretical framework allows for a holistic understanding that not only acknowledges the constraints of system level variables but also realizes the importance of domestic level variables to explain not just systemic outcomes but actual foreign policy. Thus, as a starting point neoclassical realism states in the same vein as structural realism that systemic incentives lead to foreign policy responses. However, instead of positing a direct causal relationship, neoclassical realism suggests it to be indirect, mediated by intervening variables at the domestic level. This explains variations in foreign policy behavior under similar systemic circumstances. The choice of utilizing neoclassical realist theory instead of for example neorealism is justified by the simple fact that while China and the United states face somewhat similar systemic incentives regarding climate change, the two countries have arrived at completely different positions. This variance in foreign policy outcomes must therefore be accounted for by domestic factors. Consequently, the focal point of the thesis is on the domestic economic factors which have been conducive to China signing and ratifying the Paris Agreement and subsequently exceeding the expectations of its NDCs. This means that throughout the thesis the systemic incentives will merely be treated as a global context in which domestic processes unfold. This global context, however, has the premier function as the instigator of events.

To explain the intrinsic rationality and mechanisms of the domestic economic processes, mainstream economics, which is a large body of interrelated theories and concepts that are all primarily concerned with measures to obtain economic growth, is applied. This theoretical framework has been chosen largely for two reasons. First, this theoretical framework has arguably acted as the primary course of action for China in its development path since the late seventies which has been characterized by China's immersion into the global economic order and are therefore expected to continue to do so. Second, mainstream economic theory is especially concerned with trade and how to obtain a comparative or competitive advantage which can increase profits. These advantages can

come through a long range of circumstances, such as increased production, expertise in product development, technological progress and innovation. Consequently, these theories address the suggested economic interests of China.

2.4 Empirical Considerations

To substantiate the arguments put forward throughout the thesis a wide range of both qualitative and quantitative data is utilized. This includes statistics, government white papers, research reports, secondary scholarly literature and news articles.

The data collection has been guided by the variables under investigation. The study variables are, in turn, directly linked to the three propositions, which have been derived through an integrated conception of the theoretical frameworks and the climate change setting in which actions and processes unfold. The conceptual framework is as shown in figure 2.a: Systemic Stimuli → Domestic Economic Processes → Commitment to the Paris Agreement.

Systemic stimuli as a concept is conceived through three indicators of systemic change. These are: China's position in the international system, global warming, and the global transition towards green growth. These three variables together represent the systemic incentives. The first proposition links systemic stimuli and domestic economic processes. To infer a relationship between these two levels of analysis, leadership perceptions in the form of intentions and actions are the essential indicators. Empirically these perceptions, which are assumed to align with a green growth rationality, are verified through the 11th and 12th Five-Year Plans, and general investments and R&D spending within renewable energy.

Domestic economic processes are jointly made up of actions and results. The domestic economic processes as a concept can thus be further disintegrated into two concepts, which for this project have been termed green investments and green outcomes. Green investments, as shown previously, refer to investments made by the Chinese government with the aim of achieving green growth i.e. economic growth and climate change mitigation simultaneously. For this study, these investments are operationalized through general investments within renewable energy and research & development spending. Green outcomes are the logical results of the green investments. Thus, green outcomes denote end results that possess qualities which either help mitigating climate change or contribute to economic growth. For this study, the expected outcomes include reduced prices of renewable energy, increased renewable energy capacity, shifting composition in production and

consumption of energy, growth in patent applications and grants, and increased exports of green technology.

Green investments are useful as a variable to verify the existence of a domestic economic rationality based on the idea of green growth as it tackles both threat incentive and the opportunity incentive. The green outcomes indicate whether this green growth economic rationality has any merits. Thus, the results (green outcomes) of the green investments are good indicators of whether this rationality will persist. That is, without any tangible results, it is implausible that the rationality will remain unchanged. Therefore, the green outcomes are robust indicators of whether the green investments produce any competitive advantages that can lead to economic growth, whether the investments will have any mitigating effects towards climate change, and whether the current domestic economic processes will endure. In summary, the green investments indicate the existence of a green growth rationality while the green outcomes indicate the endurability of this rationality.

To infer a relationship between systemic stimuli and domestic economic processes, the data utilized are government white papers in the form of official Five-Year Plans of the CCP, as these illustrate the intentions of the CCP. Green investments are considered the materialization of these intentions, and therefore these two variables jointly indicates the leadership perceptions of the CCP. The green investments are, however, also the first part of the economic mechanism that forms the domestic economic processes instigated by systemic stimuli.

The data utilized to validate the domestic economic processes are primarily numerical drawn from various sources. These descriptive statistics have been retrieved from official government data sets, secondary literature such as reports by independent think tanks and organization, and academic articles.

The last part of analysis investigates the relationship between the domestic economic processes, which have been clarified in the two preceding sections under proposition one and two, and China's commitment to the Paris Agreement.

Data are chiefly gathered to confirm or dismiss the propositions put forward because the three propositions are intricately linked to answering the main research question. However, to some extent, data also verify/falsify theoretical explanations in the sense that theory offers some detailed expectations of how certain processes unfold. These predictions will either be proved or disproved. Nonetheless, some parts of the theory applied is only used as explanations or assumptions and are therefore either out of scope for this thesis or confirmation is simply unfeasible. For example, some of the economic theoretical framework is built on the assumption that certain measures cause

economic growth in the long-run. Then, if these steps to gain economic growth have just only been taken, it implies that the effect of these measures are not evident yet. This means that the theory (measures → economic growth in the long-run) cannot be tested. However, the theory can still explain the perceptions, interests, and reasoning behind the measures taken and thus it can be verified that the actor behaves according to theory and follows the logics derived from theory but not its intended ultimate effects.

2.5 Method of Analysis and Causation

The thesis holds a certain conviction of the causal relationship between systemic stimuli, domestic processes, and foreign policy outcome. The systemic stimuli, however, are merely treated as a context in which domestic processes unfold. The focal point for the thesis is accordingly the domestic economic processes. This main perspective of the affinity between the different levels-of-analysis has been derived from neoclassical realism. "Because neoclassical realism stresses the role played by both independent and intervening variables, it carries with it a distinct methodological preference – for theoretically informed narratives, ideally supplemented by explicit counterfactual analysis, that trace the ways different factors combine to yield particular foreign policies" (Rose, 1998: 154). For this reason, both the theoretical framework and counterfactual analysis are utilized explicitly during analysis. Furthermore, while systemic stimuli primarily is treated as a context in which the process of interest unfolds, the relationship between the system level and the domestic level still deserves adequate attention. Sufficient consideration to all levels of analysis helps establishing a richer narrative while avoiding the logical fallacy of affirming the consequent.

To infer causality within the scope of the thesis, causation must be defined in general terms. "The core, or minimal, definition of causation held implicitly within the social sciences is that a cause raises the probability of an event occurring" (Gerring 2005: 167). For this dissertation, the relationship between X and Y, that is, the link between domestic economic processes and China's commitments to the Paris Agreement, is assumed to be a necessary causal connection. That is, Y is not possible without X, but X does not always lead to Y. Specifically within the context of this thesis, the definition of causation suggests that the domestic economic processes proposed has increased the probability of China committing to the Paris Agreement, and without these domestic economic processes, the outcome would not be present. For the general population of cases, however, it is

assumed that the proposed causing factors might as well be sufficient conditions. This reflects the ideographic nature of the study.

The thesis attempts to accomplish three separate tasks. First, to establish the link between systemic stimuli and domestic economic processes, which illuminates how economic causal mechanisms at the domestic level started. Second, to assess the effect of the green investments. These are assumed to bring about green outcomes. Thus, the second undertaking clarifies whether these processes will endure. Third, to confer the linkage between these domestic economic processes and China's commitment to the Paris Agreement.

To assess the three propositions, which all are characterized by encompassing a causal relationship, the thesis primarily uses within-case comparisons. This means that despite the qualitative disposition of the research undertaken, the study is nonetheless based on co-variational analysis. Gerring (2004: 342) supplements this by remarking that "all empirical evidence of causal relationships is *co-variational* in nature". This means that the evidence brought to the fore throughout the analysis of the systemic stimuli will be judged by its association with the domestic economic mechanisms, and that these internal economic processes will be analyzed in connection with the evidence concerning China's position in international climate negotiations. That is, one phenomenon is always judged by its affinity to another phenomenon. In addition, the sequence of events between domestic economic processes and foreign policy outcome is of utmost importance. As Evera (1997: 65) states that: "[e]vidence that a given stimulus caused a given response can be sought in the sequence and structure of events". This claim can be traced to the simple logic of causation that for phenomenon A to cause phenomenon B, phenomenon A must precede phenomenon B.

Evera (1997: 62) states that this type of research work best if there are (1) many observations of values on the IV and DV are possible; and/or (2) values on the IV or DV vary sharply over time or across space". However, in this case there is only a limited amount of observations on both the IV and DV. For the IV, the observations are limited to investments in renewable energy, patents in renewables energy, and R&D spending while for the DV the observation is limited to China's position in climate change negotiations. Consequently, the focus will be on sharp on sharp deviations, that is, how these different observations varies over time.

Due to limitations concerning causal inference that stems from the single-unit research design, the study has been supplemented with counterfactual analysis. According to Gerring (2004: 350) "the analysis of any causal relationship hinges on the counterfactual assumption – that without X (or with more or less of X), Y would be different". This is true in most cases but only if X is a necessary

condition. For this study, however, the analysis not only hinges on the counterfactual assumption. On the contrary, counterfactual analysis is carried out explicitly. According to Levy (2015: 389) "the assessment of causality […] requires the demonstration that any change in the value of an outcome variable can be traced to the effects of a single causal variable or combination of variables and not to confounding variables or extraneous influences". Consequently, this requirement is also applicable to counterfactual analysis. Furthermore, counterfactual analysis should best be driven by as few changes as possible from the real world (Levy 2015). Accordingly, the counterfactual analysis undertaken in this thesis strives to achieve these goals. That is, to investigate based on the same merits applicable to analysis of real world events, and to delimit the range of changes from the empirical world.

2.6 Delimitation

As with discussions of any subject, unfolding a topic often leads to a myriad of sub-topics and questions. For this reason alone, delimitation is a necessary component of any meaningful examination of a subject.

The aim of this dissertation is *not* to establish whether the current policies of China will accomplish the goals set forth by the Paris Agreement, to engage in a discussion of the merits of the agreement, or to address the underlying power structures from a critical theoretical perspective. Moreover, while all research to some extent is affected by the researcher, this thesis does not attempt to make any normative statements regarding the actions or inactions of the Chinese state and thereby participate in any discussion of who bears the responsibility of climate change.

Contrary to research aimed at assessing the prospects of the Paris agreement, the aim of this study is to understand what has led to the Chinese commitment to Paris Agreement. It is presupposed that systemic stimuli have instigated specific domestic economic processes. Therefore, this remains the focal point of the study. However, though domestic economic factors are considered preeminent, other factors are also regarded conducive to the Chinese climate change commitment, and consequently to the comprehension of said commitment. These are nonetheless out of the scope for this dissertation as they are deemed secondary to economic factors.

It has also been deemed necessary to delimit the number of indicators, although an increase in number of indicators would lead to a stronger test of propositions. For example, the conceptual framework for this dissertation allows certain liberties in choice of indicators. That is, green

investments could have been indicated by electric cars instead of renewable energy. However, because of a limited timeframe available for research and for the sake of conducting a proper in-depth research within a well-defined research area, the research scope has been demarcated.

Theory

3.1 Neoclassical Realism

The term neoclassical realism was coined by Gideon Rose in 1998 with his essay *Neoclassical Realism and Theories of Foreign Policy.* According to Lobell et al. (2009: 10) a single neoclassical realist theory of foreign policy does not exist but rather a variety of theories. Nevertheless, these all share some basic realist assumptions, such as sovereign states are the principal actors in the international system; the international system is anarchic which leads to self-help mechanisms where individual self-interested states are in a perpetual struggle with other self-interested states seeking influence under conditions of great uncertainty and scarcity; and that all states seek power because power is needed to gain influence and to secure the goals of the individual state – whether these interests be status quo or revisionist in nature (Lobell et al. 2009: 14-15; Heffron 2015: 3).

The point of departure for all neoclassical realist analysis is found in structural realism or neorealism as conceived by Kenneth Waltz. Therefore, Rose (1998: 150) argues that "if there is any single, dominant factor shaping the broad pattern of nation's foreign policies over time, it is their relative material power vis-á-vis the rest of the international system – and so this is where analysis of foreign policy should begin". This implies that neoclassical realists start their analysis at the systemic level and that these third image variables act as the independent variables in any neoclassical realist analysis, which is also evident in the bulk of literature on neoclassical realism (Lobell et al. 2009, Ripsman 2011). Although a country's foreign policy is first and foremost driven by its relative material capabilities and thus its position in the international system, these systemic incentives must nonetheless be mediated by intervening variables at the domestic level. This is because foreign policy is made by actual political leaders and elites which means that it is the perceptions and interests of these political leaders and elites that truly cause a specific foreign policy (Rose, 1998: 146) Thus, a clear distinction can be made between neorealism and neoclassical realism. Rose (1998: 145) characterizes neorealism as having the pattern of outcomes as the dependent variable while neoclassical realism has the behavior of individual states as the dependent variable. This basically means that neorealism emphasizes the similarities between outcomes for different states while neoclassical realism highlights changes and disparities in the foreign policies of states. The variations in foreign policies can both be between different states facing similar external stimuli or within the

same state over time (Lobell et al., 2009: 21). Therefore, for neoclassical realists there are intervening variables at the domestic level which explain variations in foreign policy behavior, and in this vein Sterling-Folker (1997: 22) proclaims that "the environment remains primarily but indirectly causal, while process remains secondarily but directly causal" as she distinguishes between systemic and domestic conditions. Therefore, in accordance with its name, neoclassical realism is some type of hybrid between classical realism and neorealism as it stresses that both external systemic variables and internal domestic variables have a causal effect on a given country's foreign policy.

As mentioned above, neoclassical realism is not a single theory and there is not a chief intervening variable linking the systemic incentives and the foreign policy outcomes. Nonetheless, certain variables seem to reappear repeatedly in much of the neoclassical realist scholarly works. Positioned within this camp, Rose (1998: 157-158) claims that "the first intervening variable they [neoclassical realists] introduce is decision-makers' perceptions, through which systemic pressures must be filtered" and continues "the international distribution of power can drive countries' behavior only by influencing the decisions of flesh and blood officials, […] analysts of foreign policy thus have no alternative but to explore in detail how each country's policymakers actually understand their situation". Therefore, any neoclassical realist analysis must entail an analysis of leadership perceptions and interests. However, there do not seem to exist a coherent set of methodological conceptions of how to determine and interpret these decision-makers' perceptions. In addition to perceptions, neoclassical realist analysis also stresses the importance of a given state apparatus' strength and how it interacts with the surrounding society, that is, state-society relations and a state's extractive and mobilization capacity (Rose 1998: 161; Lobell et al. 2009: 38). This means that in addition to determine the interests and perceptions of decision-makers, which can both lead to optimal but often suboptimal interpretations of systemic stimuli, neoclassical realist analysis also focus on state-society relations and a state's extractive mobilization capacity in which a lack hereof can act as an obstacle to policy implementation. Therefore, neoclassical realism can be defined as a response to some of the limitations found in structural realism which without a doubt prefer parsimony to precision. There are several examples of states acting differently under similar circumstances for different reasons e.g. states do not always perceive systemic incentives correctly; leaders do not necessarily react rationally in all situations; and because of domestic political and economic settings, states do not always necessarily possess the means to extract and mobilize all its resources in response to systemic stimuli (Ripsman, 2011).

3.2 Mainstream Economic Theory

The study of economics, like any other social science branch, is characterized by the existence of different schools of thought. These schools are labeled in various ways, such as classical, neoclassical, heterodox, orthodox, mainstream, Marxist etc. The labels connected with the different schools of thought are, however, used in many different ways by various economists, and often with distinct meanings and connotations attached to that specific label. Nonetheless, mainstream economics can broadly be defined as "that which is taught in the most prestigious universities and colleges, gets published in the most prestigious journals, receives funds from the most important research foundations, and wins the most prestigious awards" (Dequech 2007: 281). This implies that mainstream economics comprises of the economic theories which receive the most attention and that these ideas will tend to get reproduced but also that mainstream economics are subject to change. For this dissertation, current mainstream economics encompasses primarily neoclassical economic theory (Ward-Perkins & Earle, 2013) but also certain pioneering theories and assumption derived from classical economic theory. Thus, the conception of mainstream economics utilized for this dissertation is a fusion of classical and neoclassical economic theory which are both part of the current teachings in most universities in the Western world. Consequently, the following theoretical arguments are all gathered from large body of economic literature that includes both school of thoughts.

Neoclassical economic theory contains many interrelated models, concepts and assumptions that serve as the premise for most conventional research in economics today. It has its own distinctiveness which distinguishes it from classical economics e.g. a primary concern of the competitiveness of the firm, in contrast to classical theory's principal interest in the economic well-being of the nation-state. Nevertheless, one of the major contributions from classical economic theory is the emphasis on trade in promoting economic growth. The attention given to trade as an instrument for economic growth, is still very much at the core of mainstream economics, As Stiglitz (cited in Engel 2010: 19) argues "opening up to international trade has helped many countries grow more quickly than they would have otherwise done". The positive connotation between trade and economic growth has a long history and is especially associated with Adam Smith's 'division of labor' theory and David Ricardo's theory of 'comparative advantages'.

The division of labor refers to the increases of productivity derived from the specialization of production and the subsequent trade of these products. Ricardo's theory of comparative advantages expands on the division of labor by emphasizing that production should not only be separated and

specialized but that "countries should specialize in producing goods and services that they have either the greatest advantage, or the least disadvantage, in producing in terms of relative costs of production" (Engel 2010: 2). Consequently, for both Smith and Ricardo, and most mainstream economist today, specialization and subsequent trade is assumed to result in economic growth.

According to the theory of labor division, production is increased through specialization. Additionally, according to economies of scale theory, increases in production leads to reduced production costs. Thus, economies of scale address the matter of relative cost of production in a way that can enhance the competitive advantages. Economies of scale theory has originated within microeconomics and are thus primarily a neoclassical economic theory but can function similarly within macroeconomics. The concept signifies a situation in which a firm or a state purchases inputs on a large scale which therefore decreases the price per unit (Heakal, 2018).

In addition to economies of scale theory, several other aspects of production can increase competitiveness of a manufacturer. First-mover advantage theory (FMA) denotes several advantages that arise from being first but particularly emphasizes technological leadership in which two points are made. First, there exist a so-called learning curve which basically is the same curve as economies of scale in which increased production leads to reduced prices per unit input. In FMA, however, the learning curve refers to how employees gradually become quicker performing their function and thus the output increases. This means as time passes the production will increase and that through experience a gap in know-how is created between an existing firm and a new entering company which in turn can create barriers to entry for others because only a handful of firms will be able to compete profitably (Lieberman & Montgomery, 1988: 42-43) Secondly, technological leadership denotes a situation "when technological advantage is largely a function of R&D expenditures, pioneers can gain advantage if technology can be patented or maintained as trade secrets" (Lieberman & Montgomery 1988: 43). Thus, pooling resources into research and development can lead to technological progress through innovation which can secure market shares by creating a technological gap between companies, which can be further sustained if the technology can be patented. Theoretically, this means that an existing gap in the level of technological advancement or know-how between two firms, which has occurred due to late entry of either company, can be countered by large investments in R&D.

Innovation is both characterized as a process in which new ideas and technology are created and as the outcome of this process. Innovation is generally accepted to be crucial for economic growth as innovation increases productivity which leads to economic growth by stimulating wages and

business profitability (ECB, 2017). “Undoubtedly the capability to innovate and to bring innovation successfully to market will be a crucial determinant of the global competitiveness of nations over the coming decade. There is growing awareness among policymakers that innovative activity is the main driver of economic progress and well-being as well as potential factor in meeting global challenges in domains such as the environment and health” (OECD, 2007). Thus, innovation can enhance the competitiveness of a company which on an aggregate level can increase the economic growth of country. Therefore, governments all over the world are increasingly interested in stimulating the innovative capabilities of domestic firms by intensifying R&D spending.

Technological advancements through innovation can also bring about societal change – progressing from one economic stage to another. While the idea of different economic growth stages is especially associated with Rostow’s book from 1960 *The Stages of Economic Growth* and modernization theory in general, it is commonly accepted that for a society to advance economically, a society will have to undergo a process of industrialization in which the economy of the society transforms from being based primarily on agriculture to one based on the manufacturing of goods (Kenton, 2018). However, for the continuation of economic development a country needs to move up in the global value chains (GVCs). Because of specialization, production processes have dispersed globally. “[..] the emergence of borderless production systems – which may be sequential chains or complex networks, and which may be global, regional or span only two countries. These systems are commonly referred to as global value chains” (UNCTAD, 2013: 122). Thus, global value chains are best illustrated as the global patterns in production, starting with the extraction of raw materials which gets processed and manufactured in one or more stops before arriving in its last destination for final consumption. Consequently, moving up the global value chains means to be at highest possible position in terms of value-added to a product, which will create the highest economic payoffs. In this endeavor technological progress and innovation is the key.

3.3 Theoretical Synthesizing

Three propositions are offered. These are based on the integration and synthesizing of the two distinctive theoretical frameworks within the context of climate change, and in alignment with the four basic assumptions which underpins the research, that is: 1) foreign policy is an extension of domestic politics; 2) states are self-interested; 3) economic growth is the primary concern for the

Chinese Communist Party; 4) domestic economic processes are essential to understand China's commitment to the Paris Agreement but not exclusive.

The propositions have a single common denominator which is green growth. That is, all three propositions is in some way related to green growth. The first statement claims that systemic stimuli prompt the Chinese leadership to make green investments, hence it concerns the origins of a green growth rationality. The second statement asserts that green investments generate green outcomes and is consequently concerned with the process of green growth. The last proposition states that these domestic economic processes have strengthened China's commitment to the Paris Agreement, hence it directly links domestic green growth processes with climate change cooperation.

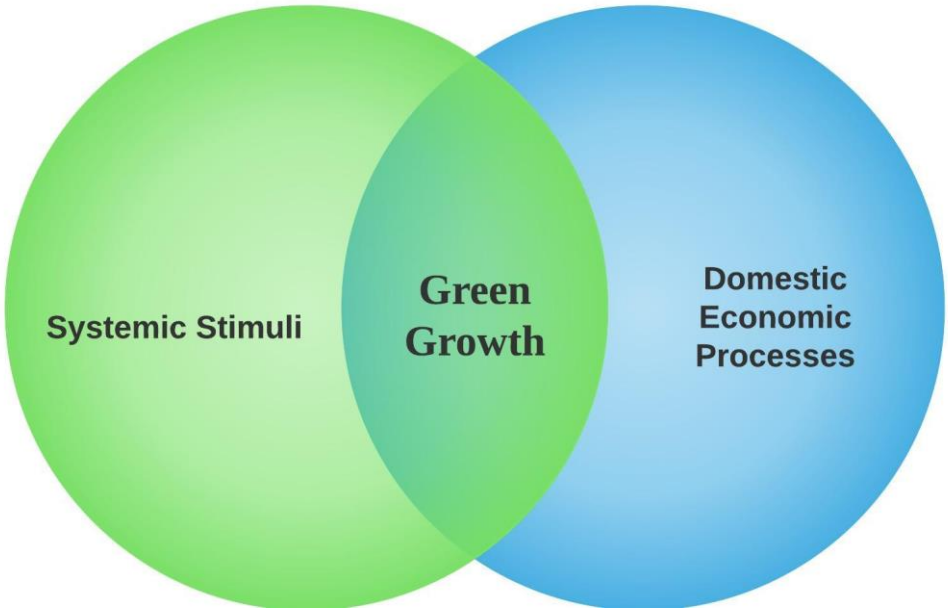

Fig. 3.a Explanatory figure: The nexus between systemic stimuli and domestic economic processes is comprised of green growth

Source: Compiled by author

The theories utilized are mainly used to explain different phenomena but can nonetheless also explain different aspects of the same phenomenon. A case in point is economic growth which throughout the research has been regarded as the main driver for all actions taken. From this perspective, however, the two theories explain fundamentally different aspects of economic growth. Neoclassical realism regards economic growth as a source of power and conceive it from the perspective of the political actor. That is, what are the interests of the actor (e.g. economic growth) and why do these interests form. Mainstream economic theory, on the other hand, is concerned with measures that lead to

economic growth. Hence, mainstream economics provide the tools or methods, and the corresponding theoretical explanations of the accumulation of capital.

For neoclassical realists, indeed for all realists, economic growth can be utilized as a source of power. According to Mearsheimer, states possess two types of power: military power and latent power. In this sense, wealth is a part of state's latent power and thus one of the ingredients that can be utilized to the build-up of military power (Mearsheimer, 2006: 72). The inherent perspective of this thesis does, however, differ to some extent from this outlook, and does not limit itself to a view in which wealth essentially only possesses the potential for power. From the standpoint presented here, a state possesses power when it can influence other states' actions and thereby control its external environment. For example, the European Union is here conceived as a powerful actor which can utilize its economic power to stronghold other great powers and influence politics on a global scale, whereas in the view of Mearsheimer, the EU must be perceived only as a quasi-great power but with great power potential. Thus, affluence is always a desirable outcome. The reason is not only limited to the role of wealth in terms of the advancement of external power. It also relies on the fact that the interests of states are not restricted to the ability to control its external environment but that these interests coexist with the desire to secure and maintain power from within. Likewise, Sterling-Folker (1997: 9) argues that "states – are embedded in both their own societies and the international system, and their interests and policies are affected by conditions in both arenas". That is, while it can be analytical purposeful to separate domestic and systemic incentives, the two domains remain intricately linked in terms of national interests.

The two theoretical frameworks complement each other. Neoclassical realist theory is first and foremost used to explain how foreign policy is formed in a nexus between systemic incentives and domestic interests. However, it also accommodates a set of basic assumptions about the nature of the interests of states that explain the underlying motives behind political action, such as the pursuit of economic growth. Mainstream economics, on the other hand, complement neoclassical realism by explaining the economic processes which are instigated by political actions. It is, however, only when these theoretical frameworks are placed within the context of climate change that these concerns translate from traditional economic growth to green growth. That is, economic growth which also accommodates environmental considerations.

Analysis

1st Proposition

The first proposition holds that: *systemic stimuli prompt the Chinese leadership to make green investments*. Thus, the first proposition presupposes the existence of a green growth rationality activated by systemic stimuli. Therefore, while systemic stimuli primarily are treated as a context in which domestic processes evolve or as the inputs that initiate the causal mechanism of interest (the domestic economic processes), these systemic incentives nevertheless bear mentioning since they govern the boundaries of the CCP's actions. Accordingly, the following sections include (1) systemic stimuli in which China's international rise and interests are touched upon while placing the analysis in the context of climate change; (2) perception of systemic stimuli in which the link between systemic stimuli and green investments is established though a review of the 11th and 12th Five-Year Plans; (3) green investments in which both overall investments and R&D spending within renewable energy is examined.

4.1 Systemic Stimuli

The basic conception of the relationship between the international system and domestic processes is that the international system is an environment in which domestic processes unfold. These processes are therefore constrained by the context in which they develop. The relationship is, however, also based on reciprocity. This is the case when China experiences economic growth, which both indicates ongoing domestic developments and systemic changes in the distribution of power. Nonetheless, neoclassical realism starts its analysis at the system level in accordance with neorealism. According to neoclassical realism, the most important variable at this stage of analysis to determine foreign policy behavior is a state's power vis-á-vis other states. For China this indicates a position characterized by a momentous rise to great power status in which China is now the second largest economy of the world.

Neoclassical realists assert that states, as a response to the uncertainties of other states' interests, motives and behaviors in an anarchical system, will tend to try to influence their environment as much as possible (Rose, 1998). This consequently means that the scope of ambitions for a state will tend to increase in accordance with its relative position in the international system. Thus, the fact that China has climbed up the ladder within the international system essentially means that China's ambitions have expanded accordingly.

China's rise in the international system is especially connected to the economic reforms implemented by Deng Xiaoping in 1978 and China's subsequent opening-up policies. Furthermore, this indicates that China's rise is above all linked with its entry into the capitalist world order. This economic order, in turn, is particularly associated with a growth imperative that underpins every action taken. As a result, economic growth remains a chief driver for China's external interests. The primary status given to economic growth has characterized China during its rise and will undoubtedly continue to do so.

China became the world's second largest economy in 2010 by surpassing Japan. This ascendancy to the center stage of world economics is mainly associated with dynamic economic reforms since the late 1970s, and subsequently, increased trade with the outside world. In late 2001, China joined the World Trade Organisation (WTO), which effectively made China the world's factory (Li, 2016). The accession of China into the WTO epitomizes China's entry within the global capitalist order. As such, the integration of China into the world economy has had significant effects on the Chinese economy, which has gone from being ranked the world's sixth largest economy before WTO membership to being ranked second in 2010. This ascendancy has been steered by China's impressive annual growth rates, which grew consecutively from 9.131% in 2002 to 14.231% in 2007 (World Bank, n.d.). This period has, however, also been characterized by an exponential increase of Chinese carbon dioxide emissions, which as of 2005 meant that China surpassed the United States for the notorious title as the world leading emitter of CO2. Thus, much of the economic success of China is at also associated with current domestic challenges for China, such as increased air and water pollution, while from a global perspective, the Chinese rise is connected to the dangers deriving from climate change.

China's rise has increased its scope of ambitions in terms of international influence which inevitably also means that China must continue its path of economic development. However, the choices available for how to pursue these ends are constrained owing to other systemic stimuli that interfere with these goals. Rose (1998: 151) asserts that "over the long run a state's foreign policy

cannot transcend the limits and opportunities thrown up by the international environment". For China this means that to pursue economic growth and increase its sphere of influence in the international system, the opportunities and threats must be assessed and acted in accordance with.

In parallel with China's rise and to some degree as a consequence of its rise, human-induced climate change has become a systemic factor that represents both opportunities and threats to China's economic interests. The threats stem from the main characteristic of climate change which is global warming. This systemic change produces numerous negative environmental, social and economic consequences for all countries around the globe. The direct consequences of the increased concentrations of carbon dioxide in the atmosphere include rising sea levels and more frequent extreme weather events (Li, 2016). Hence, climate change is directly linked to the concept of environmental security. This concept is typified by a wide range of different connotations within the nexus of human development and conflict, environmental deterioration, and human security. The primary significance of the concept, however, remains that environmental deterioration is not only conceived as an undesirable outcome by itself, but is understood through a security prism in which environmental degradation is apprehended through the negative economic and health consequences for individuals and societies alike. In this vein, Economy (2013: 201) argues that "environmental degradation and pollution constrain economic growth, harm public health and engender social unrest". This essentially means that the negative consequences of climate change, stemming from global warming, are multifaceted. Furthermore, in the case of China, this aligns with the basic assumption that at the domestic level, the Chinese Communist Party pursues economic growth to ensure its continued legitimacy. That is, to avoid social unrest as a consequence of either diminishing economic growth or increased air pollution, which potentially poses an internal security threat to the Chinese regime, the leadership is prompt to make mitigation efforts. This also implies that the general public in China stress two seemingly contradictory demands. On one hand, they require continued economic growth, while on the other, the public demand clean air. These requests can, however, be met through the concept of green growth that accommodates both environmental concerns and the need to maintain the economic development.

The opportunities of climate change derive from the international response to global warming. This reaction is typified by mitigation efforts that include a transition to green growth, which encompasses all types of endeavors that can help ensure a sustainable economy while reducing emissions of greenhouse gasses, such as a transition to renewable energy. The transition is to some extent directed by government subsidies and investments but will increasingly be market-led as new

economic opportunities arise. In a speech by the EU Commissioner for the environment in 2011, several key areas are emphasized in the transition towards a global green economy, such as water management, renewable energy, ecosystem services, and oceans (Potocnik, 2011:3). The green economy is characterized by technological progress, which can help stabilize natural and environmental systems while simultaneously stimulate economic growth and thereby secure social development goals (UNCTAD, 2012). For China, this global change signifies the opportunity to engage in expanding industries with the potential for industrial upgrading through the process of technological advancement and innovation.

The renewable energy sector represents an avenue where it is possible to pursue green growth. From 2010 to 2017 global investments in renewables exceeded 200 billion dollars. This unmistakably illustrate the steady global transition towards a green economy.

In summary, the systemic incentives are characterized by a rising China, which during its rise has expanded its ambitions of international influence. This in turn requires the continuation of economic growth and development. Thus, to pursue this aim, China needs to interpret the opportunities and threats to this objective present in the system, which currently is typified by challenges derived from global warming but at the same time of economic opportunities derived from the global transition towards a green economy. The systemic stimuli materialize at the domestic level in a nexus between perceptions of systemic stimuli and domestic interests. Thus, systemic stimuli and domestic interests initiate the domestic causal mechanism which is characterized by green investments and green outcomes.

4.2 Perceptions of Systemic Stimuli

The systemic stimuli do not invoke actions by themselves but through agents. In this case, these agents are the Chinese top leadership, which directs Chinese actions in both domestic and international affairs. The affinity between the systemic input and the domestic causal mechanism is therefore formed through leadership perceptions. The examination of the Chinese leadership's perceptions of systemic stimuli is partially done through an assessment of the intentions of the CCP and partly through a review of the actions undertaken by the Chinese state.

The official Five-Year Plans (FYPs) of the Chinese government (from 2006-2015) illustrate the intentions of the Chinese Communist Party and thus to some extent reveal the CCP's perceptions of systemic stimuli. However, the intentions of CCP are incomplete as indicators of

perceptions without being backed by actions. Thus, the Five-Year Plans in combination with green investments embody the Chinese leadership's interpretations of the threats and opportunities present under climate change. Gerring (2004: 348) argues that "intentionality is an integral part of causal analysis". This perspective acknowledges the importance of agency in causal analysis. Thus, while systemic stimuli incentivize specific actions or set the boundaries for the action undertaken, the facilitator of actions are nevertheless agents. This means that the intentions and actions of the Chinese Communist Party, within the boundaries of systemic incentives, link phenomena on different levels of analysis in a causally meaningful way.

The examination of the two Five-Year Plans, that is, the 11th and the 12th clearly illustrates the CCP's environmental and economic concerns within the context of climate change. These two periods, however, inform distinctively different aspects of the CCP's perceptions and responses to the systemic stimuli. The first period clarifies the longevity of perceptions while the second period illustrates the maturity of ideas which has led to the Paris Agreement.

4.2.1 Growing Awareness

The 11th Five-Year Plan spanned the years from 2006-2010 and is a testimony to a reality in which the Chinese leadership has, in fact, for a long time acknowledged the damaging effects of climate change and has sought ways to address the issue. In 2006, Ma Kai, at that time chairman of the National Development and Reform Commission (NDRC), explicitly stated that in contrast to previous economic development, which had been characterized by resource consumption and indifference to the environmental cost of economic growth, moving forward the path should increasingly be attentive to conservation and enhanced utilization efficiency of resources (NDRC, 2006). At the time, this seemingly new-found awareness of environmental hazards caused by unrestrained economic growth resulted in specific environmental targets by the government. Thus, the 11th five-year plan placed several binding commitments including an energy intensity reduction which meant that energy consumption per unit of GDP had to be reduced by 20% below 2005 levels between 2006 and 2010 (IEA, 2017a).

The neglect of environmental concerns combined with cheap labor had given China a competitive edge, but moving forward, this edge was to be made up by innovation while in parallel to these changes, Ma Kai emphasized that the economy in China ought to be gradually moving from government intervention to a market-driven economy (NDRC, 2006). The 11th Five-Year plan

signifies a break from China's previous policy position of "development first, treat pollution later" (Mochizuki & Zhang, 2011: 7). Thus, the Chinese government recognized the harmful effects of climate change while stressing that economic growth should increasingly be driven by innovation.

The main points put forward in the 11th Five-Year Plan explicitly affirm that a growing awareness within the Chinese Communist Party started to emerge between 2006 and 2010. This means that the CCP already at the outset of the 11th FYP was attentive to systemic stimuli and seemingly prepared to push for changes for the Chinese economy. These changes include obtainable measures to mitigate the negative effects of climate change while pushing the Chinese economy towards a new stage of economic development characterized by innovation and technological progress.

The 12th FYP builds on the foundation laid in the 11th FYP and consequently stresses the importance of transforming the contemporary economic development mode. Steering the transition, it specifically articulates: "[s]cientific progress and innovation will support the transformation" (CBI, 2011). Furthermore, the plan emphasizes "the importance of building a resource-saving and environment-friendly society should be stressed to save energy, reduce greenhouse emissions and actively tackle global climate change" (CBI, 2011). Thus, the 12th five-year plan points out that China is in a process of economic transformation in which scientific research, technological progress, and innovation are leading the way. Furthermore, it stresses the importance of environmental sustainability. To this end, it puts forth several binding targets, such as: (1) energy intensity: energy consumption per unit of GDP shall decrease by 16%; (2) carbon intensity: CO2 emissions per unit of GDP shall decrease by 17%; and (3) there shall be an increase of non-fossil fuel usage in primary energy consumption from 8.3% in 2010 to 11.4% in 2015. To meet these targets, the FYP among other means emphasizes the implementation of wind and solar power, as part of new strategic industries (CBI, 2011).

It appears that the Chinese Communist Party was aware of the harmful effects of climate change at the outset of the 11th Five Year Plan while acknowledging the necessity to transform the economic development mode through innovation. These ideas were further substantiated in the 12th FYP which more explicitly laid out a framework in which the use of non-fossil fuels would actively contribute to the interests of mitigation and economic development i.e. green growth. These ideas have, however, first been translated into sizable investments in the latter part of the 11th FYP period.

4.3 Green Investments

Green investments as a concept accommodates all types of products and production processes that respond to both the threats and opportunities of climate change. Renewable energy fits this description. That is, renewable energy tackles the negative effects of climate change through mitigation while providing an avenue for innovation, technological advancements, and export of products.

4.3.1 Investments in Renewables

China's investments in renewable energy have expanded significantly from 2004-2015. The expansion of investments in renewable energy is observable in China's share of global investments which have grown accordingly as illustrated in figure 4.a.

Figure 4.a elucidates an important trend, which is China's ascendancy as the world's largest investor within the renewable energy sector. This rise has to a certain extent happened on behalf of Europe's share of investments. That is, China has experienced an increase in global shares of investments in renewable energy from 6.5% in 2004 to 35.99% in 2015. The increase in shares is primarily the consequence of two factors. First and foremost, consistent expansion of investments by China. Second, lowering levels of investments by especially Europe. At its height, the European investments soured at $122.88 billion in 2011 but has since then plummeted to $48.76 billion in 2015.

The rise in global shares by China is especially significant from 2012 and onwards. China has, however, been the number one investor in the world since 2011, and already in 2009 China surpassed the United States in terms of total investments in renewable energy (Gosens & Lu, 2013: 234).

In 2012 China invested $61.7 billion, while in 2013 investments remained at the same level as in 2012. In 2014 Chinese investments reached $87.78 billion, which just grew even more the year after. That is, the whole period covers a total increase of investments by China in renewable energy from $3.03 billion in 2004 to $102.9 billion in 2015. In addition, as of 2015, China's investments in renewable energy, as a percentage of GDP, were at 0.9 percent compared to India at 0.5% and the United States at 0.2% (Ritchie & Roser, 2018).

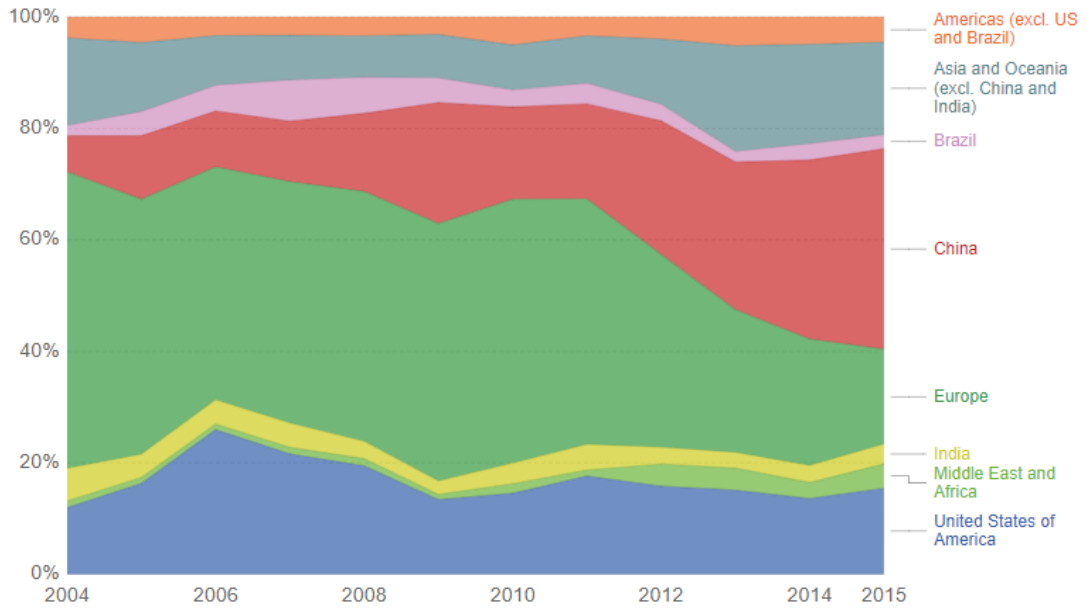

Figure 4.a Global Renewable Energy Investments by region (China = Ruby red color)

Source: Ritchie & Roser (2018)

4.3.2 Research & Development Spending

China's total expenditure on R&D has from 2011 to 2015 grown from 868,700,930,000 Yuan to 1416,988,461,000 Yuan (UNESCO, n.d.), which is a rise from about $125 billion to $205 billion, and portrays an average annual growth rate within research & development spending of about 13%.

China's research & development expenditure as a percentage of the gross domestic product has risen from 0.896 percent in 2000 to 2.066 percent in 2015 which is just short of its intended target of 2.2%. As a percentage of GDP, China still falls short in comparison to the United States, which as of 2015 spends 2.794 percent of GDP (World Bank, n.d.). Nonetheless, China is rapidly coming close to the average spending on R&D within the OECD countries, which on average spends 2.357 percent of the gross domestic product (OECD, n.d.)

According to Armstrong (2017) the governmental research & development spending within renewable energy in 2016 is for China almost double the spending of the United States. Specifically, China spent $1.9 billion, Europe $1.4 billion, and the United States $1 billion. While the fourth largest investor, defined in the form of country/region, in 2016 was Asia/Oceania excluding China and India at $0.8 billion. However, when combining both corporate and governmental R&D spending, the picture is somewhat different depending on the year.

For example, in both 2012 and 2013 Europe spent $3.3 billion on R&D within renewable energy. Of these 3.3 billion dollars, two billion dollars were corporate R&D. For China, the government spent $1.4 billion in 2012 and $1.5 billion in 2013, but the corporate sector, however, only invested $0.5 billion for both years. Thus, while governmental spending remains higher in China, the total amount spent is considerably higher in Europe. For the United States both 2012 and 2013 the total amount spent on R&D were about the same level as China (FS-UNEP, 2013; FS-UNEP, 2014).

By 2014, China's total R&D spending in renewable energy reached $2.4 billion while in 2015, China hit $2.8 billion against Europe at $2.9 billion and the United States $1.6 billion (FS-UNEP, 2015; FS-UNEP, 2016).

4.3.3 Global Ambitions in Renewables

In 2009 China surpassed the United States in terms of money spent on investments in renewable energy. Furthermore, China has from 2011 and onwards been the world's biggest investor within the renewable energy sector. The evidence clearly illustrate that China regards renewable energy as a worthy investment subject which necessarily means that the CCP believes that the investments in the renewable energy sector will lead to a return on investments. The returns are, however, not limited to short-term economic profits but also includes the possible mitigation of future effects of climate change. That is, the intentions and actions of the Chinese Communist Party quite obviously seem to suggest the existence of green growth rationality. This is based on the intentions of the CCP, which are laid forth in their Five-Year Plans, and the actions of the CCP, visible in the form of intensified investments and R&D spending within the renewable energy sector.

The data on Chinese investments in renewable energy illustrates two important facts. First, China has become a very large and significant investor in renewable energy. Second, according to the data on the composition of shares of global investments in renewable energy, global investments have since 2004 predominantly been led by Europe and to some degree by the United States. This means that although China has emerged as a huge investor and currently the most important one, China might suffer from the disadvantages of being a latecomer.

The expansion of Chinese investments in renewable energy has been accompanied by growth in general research & development spending. This growth means that China has virtually been able to close the gap between China and developed countries such as the United States and the OECD

countries in terms of R&D spending as a percentage of GDP. For China this percentage has grown in parallel with an extensive expansion of the Chinese economy. This consequently means that the total expenditure on R&D in China for the same period has risen dramatically.

In relation to R&D spending within renewable energy, as of 2016, the Chinese state has by far surpassed its competitors with a total of $1.9 billion spent. This is almost double the amount of the US, and $500 million more than Europe. The trend is, however, somewhat different when including corporate R&D spending. The picture drawn from the numerical data on Chinese R&D spending from 2012 to 2015 illustrate two important trends. That is, the Chinese government is by far the most active contributor to the total R&D spending while corporate China seem to fall behind its European and American counterparts.

China evidently invests heavily in renewable energy both in terms of overall investments but seemingly also in terms of R&D. This suggests several important realities. First, the sheer size of investments means that the Chinese leadership expects it to have scale effects that reduce prices of renewables. Furthermore, in agreement with the statements put forth in 12th Five-Year Plan, the renewable energy sector appears to be of strategic value to the CCP. Consequently, China must conceive renewable energy as an avenue for its goals concerning both mitigation and innovation.

The fact that investments in renewable energy have been accompanied by increasing research & development spending clearly indicates that the Chinese government, in line with its announcements in the 11th and 12th Five Year Plans, seeks economic development through innovation.

The findings presented above verifies the proposition that systemic stimuli prompt the Chinese leadership to make green investments. There is a strong connection between the intentions of the CCP, which are evident in both its 11th and 12th Five-Year Plans, and the actions taken to back up the fulfilment of these goals. The evidence thus strongly corroborates that the Chinese leadership perceives climate change as possessing both economic threats and opportunities.

In summary, a green growth rationality has emerged in a nexus between the current systemic stimuli characterized by climate change and Chinese economic interests. This green growth rationality has materialized at the domestic level in the form of intensified investments within renewable energy and R&D spending by the Chinese government. The investments are in turn expected to generate green outcomes, which contribute to the mitigation of climate change while stimulating economic growth through innovation. China is, however, a latecomer in terms of investments in the renewable energy sector but is seemingly trying to offset the negative effects of late entry by profoundly increasing investments.

2nd Proposition

The second proposition builds on the first as it holds that: *green investments bring about green outcomes.* The expected results of green investments can be defined as either possessing mitigating attributes or economic growth potential, or both. The following section on green outcomes include (1) prices of solar and wind power; (2) renewable energy capacity; (3) composition of energy consumption and production; (4) wind and solar patents; and (5) exports of renewables

The outcomes of investments do not only verify or reject the mainstream economic theoretical framework and the expected mitigative effects of renewable energy investments, but even more importantly, it also speaks to the endurability of the domestic economic processes. That is, the greater results yielded warrant increased or at least sustained investments within the sector.

4.4 Green Outcomes

The large and continuously increasing investments in renewable energy by the Chinese government consequently raise expectation in terms of green outcomes. First, the size of investments made by China increases the expectations of a considerable price drop in renewable energy products. Second, as indicators of the mitigative effects of investing in renewable energy, the energy capacity indicates the potential usage of renewable energy while the composition of energy consumption illustrates the actual effect of investments for mitigation. Third, patents indicate whether China is making any technological progress through innovation while exports indicate whether China's products can compete on the global market.

4.4.1 Prices of Solar and Wind Power

Prices of renewable energy have fallen significantly. According to Fialka (2016) prices for the solar power industry dropped 80 percent between 2008 and 2013. While 2017 apparently was the tipping point for wind power. That is, 2017 was the year in which energy obtained from wind became the cheapest source of electricity in most locations around the world (Milborrow, 2018). In an article in Forbes magazine, it is estimated that in the period between 2009 and 2017, the prices per watt for solar panels were reduced by 75 percent while for wind turbines the prices per watt declined by 50

percent (Shellenberger, 2018). These findings are further substantiated in a report by Bloomberg New Energy Finance, which estimates that the prices of both wind and solar power will keep reducing until 2050, see figure below. Thus, the overall trend for prices of wind and solar power is characterized by a sharp reduction in prices, which is estimated to continue for several decades.

The significant reduction of prices of solar and wind power is primarily a result of scale manufacturing in China (Goodrich et al. 2013: 2811). That is, the investments of China within these sectors have been so large that the sectors are experiencing economies of scale effects which have reduced prices significantly. The declined prices of solar and wind power speak well to the future competitiveness of renewables as an energy source.

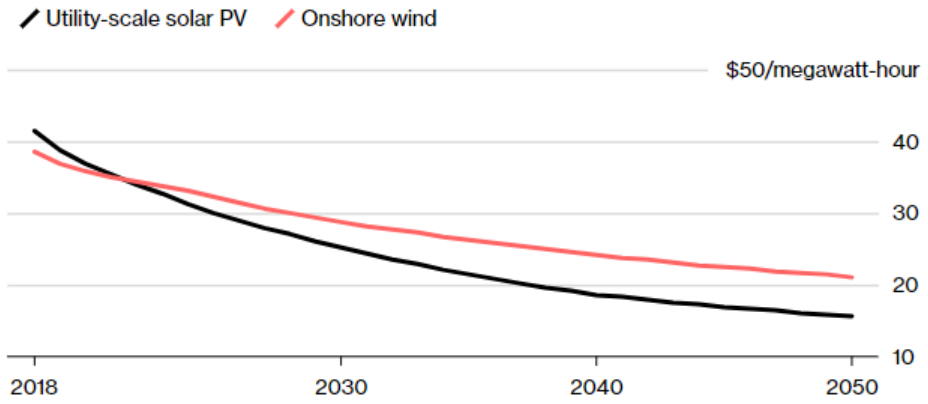

Fig. 4.b Projected trajectory of wind and solar power prices

Source: Bloomberg New Energy Finance, cited in Landberg & Hirtenstein (2018)

4.4.2 Renewable Energy Capacity

The renewable energy capacity is the direct effect of investments in renewable energy. As such, it does not reveal whether an energy transition is taking place, but it does, however, illuminate its potential. Moreover, the trends within renewable energy capacity indicates the respective positions of different renewables such as hydropower, wind power, and solar power, within the renewable energy mix.

From a global perspective, capacity within renewables has risen each year since 2000. The cumulative global capacity of renewable energy has been increasing consistently since 2000 from about 800GW to more than 1800GW in 2014. The cumulative capacity in this period is typified by a disproportionate distribution between types of renewable energy where hydropower represents the biggest contributor by far. Nevertheless, wind and solar power are becoming increasingly relevant to

renewable capacity mix (IRENA, 2015). This trend is also seen in both figure 4.c, which depicts the cumulative globally installed renewable power capacity and in figure 4.d, which illustrates the installed renewable power capacity – net additions, that is, globally added capacity of renewables in GW from 2001 to 2014.

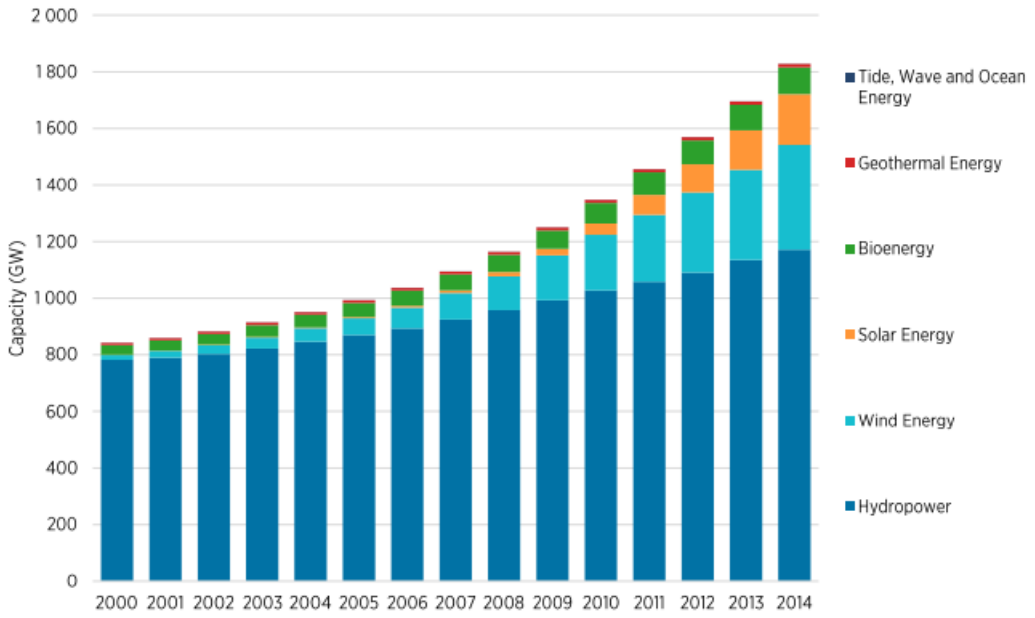

Fig. 4.c Global Installed Renewable Power Capacity – Cumulative

Source: IRENA (2015)

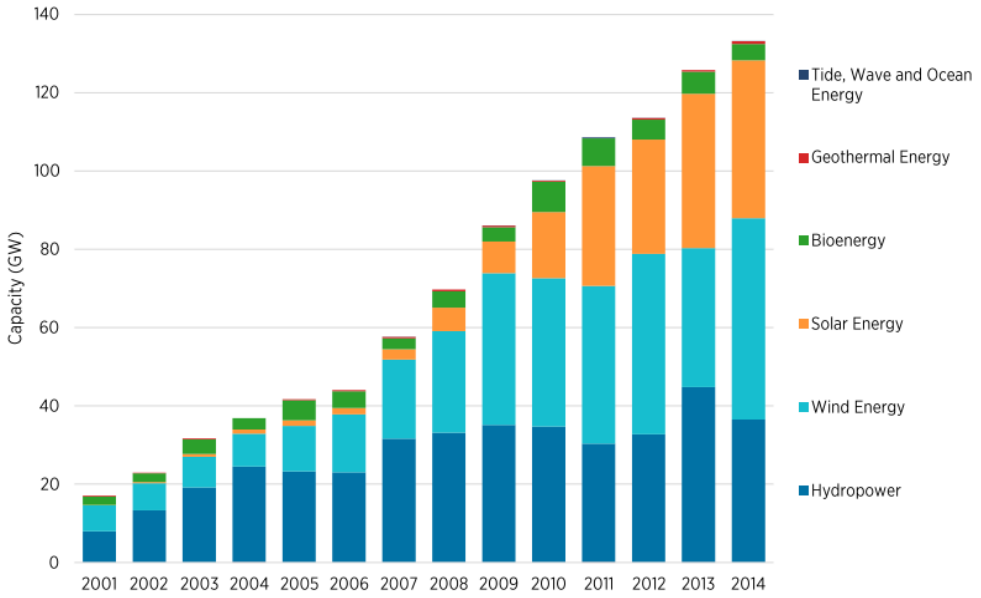

Fig. 4.d Global Installed Renewable Power Capacity – Net Additions

Source: IRENA (2015)

Figure 4.d particularly exhibits two global trends: First, the added capacity is not only limited to a fixed increase each year, on the contrary, the growth intensifies each year from net additions of around 20GW at the beginning of the century to more than 100GW net additions in 2011 and onwards. The second trend of this global transition is the distribution between different sources of renewable energy. While the transition was mainly driven by hydropower and wind power until 2010, solar power has since then taken up about one third of the global net additions.

The global trend does not, however, reflect the Chinese experience one-to-one but shares many similarities. The distribution of renewable energy capacity in China is by and large also dominated by hydropower. This has been the case from the turn of the century and still is as of 2014. However, in 2009 wind power started to increase its share of the renewable energy capacity mix, and from 2013 onwards a similar trend started for solar power. However, as of 2017 the distribution of renewables in China is still characterized by a preeminence of hydropower, which accounts for a little more than the installed power capacity of wind and solar combined: hydropower 312.700 GW, wind power 161.420 GW, and solar power 130.632 GW (IRENA, 2017). This is more or less similar to global patterns at the end of 2017 where hydropower represented 53%, wind power 23%, solar power 18%, and others 6% (IRENA, 2018).

As of 2014, China accounts for 31% of the global wind capacity - ahead of the United States at 18%, Germany at 11%, and India at 6%. In same year, China possessed 16% of global solar capacity, second only to Germany at 21%, and ahead of the United States at 11% (IRENA, 2015).

In summary, while hydropower remains dominant both globally and in China, its share of the total renewable power capacity has been decreasing because of rapid growth within the wind and solar power sectors. This trend started for China around 2009 with wind power and expanded to solar power around 2013. This of course reflects the lag time between investments and results.

Seemingly, China has come from behind in the wind power sector but has now caught up and taken the leading position. This trend thus began long before the Paris Agreement but has, however, only seemed to intensify since. According to IEA (2017b) “China alone is responsible for over 40% of global renewable capacity growth”. Therefore, China not only responds to the global transition patterns but to some extent directs the transition.

The results clearly illustrate the ambitions of the Chinese government, that is, to become leaders in the renewable sectors. China has long been leading in hydropower but has from 2009 increasingly been paying attention to the wind power industry and from 2013 and onwards put a lot of money in the solar power sector. This has resulted in large increases of renewable energy capacity

for China, and thus reflects a huge potential in terms of a domestic transition to renewable energy that can benefit both domestic and global mitigation efforts.

4.4.3 Composition of Energy Production and Consumption in China

	Coal		Primary electricity		Crude Oil		Natural Gas	
2009	76.8	71.6	9.8	8.5	9.4	16.4	4.0	3.5
2010	76.2	69.2	10.4	9.4	9.3	17.4	4.1	4.0
2011	77.8	70.2	9.6	8.4	8.5	16.8	4.1	4.6
2012	76.2	68.5	11.2	9.7	8.5	17.0	4.1	4.8
2013	75.4	67.4	11.8	10.2	8.4	17.1	4.4	5.3
2014	73.6	65.6	13.3	11.3	8.4	17.4	4.7	5.7
2015	72.2	63.7	14.5	12.1	8.5	18.3	4.8	5.9
2016	69.6	62.0	16.9	13.3	8.2	18.3	5.3	6.4

Table 4.a Composition of energy production and consumption. Portrayed as a percentage of total energy production or consumption respectively (%) (Production % to the left; Consumption % to the right)
Source: NBSC (2017)

Both total production and total consumption of energy in China has risen in the period between 2009 and 2016. However, production seemingly peaked in 2014. In the same period, the consumption of energy has been increasing consecutively year after year. The consumption of energy has gone from 336,126 to 436,000 (measured in 10,000 tons of SCE).

The table of China's energy production and consumption composition from 2009 to 2016 demonstrates especially one important trend in China's domestic energy production, which is a slow but steady turn away from coal to renewables. This means that the share of energy production generated by renewables and natural gas has increased. For renewable energy, the trend saw a drop in 2011 but has since 2012 been rising steadily. Turning to the energy consumption patterns, many of the same tendencies can be observed. However, there exists a discrepancy between crude oil produced and crude oil consumed. This reflects that China does not have large oil reserves and therefore is inclined to import crude oil. Furthermore, while the rise in the use of renewables is observable in both production and consumption, there also exist a divergence here - as consumption of renewable energy is consistently lower than the production of renewable energy. Even so, both

production and consumption patterns by and large illustrate the same general tendencies. First, a reduction in coal production and consumption. Second, a rise in the production and consumption of renewables. The overall composition does, however, also visibly demonstrate that China is still overly dependent on coal for energy.

The data on renewable power capacity in China display what type of renewables China is focusing on, the scope of ambitions vis-á-vis other nations, and the potential effects for mitigation. The composition of energy production and consumption, on the other hand, indicate whether there are any actual mitigating effects. The most important trend in this regard is the growing percentage of primary electricity (i.e. renewables). The numbers clearly reflect the growing investments by China, which have resulted in a consistent rise in renewable energy's share of both energy production and consumption in China since 2011. However, the numbers also indicate that there is discrepancy between production and consumption. This highlight the fact that China has some challenges in terms of utilizing its full potential within renewables. China is nonetheless well on its way in its slow but steady energy transition as it increases its usage of renewables while reducing its dependency on coal.

4.4.4 Renewable Energy Patents

For all types of patents, China has increased its patents applications filed through the World Intellectual Property Organization (WIPO), only second to the United States in 2017 (WIPO, 2018). This reflects the overall effect of the Chinese leadership's repeated efforts to bring innovation to the fore of Chinese modernization.

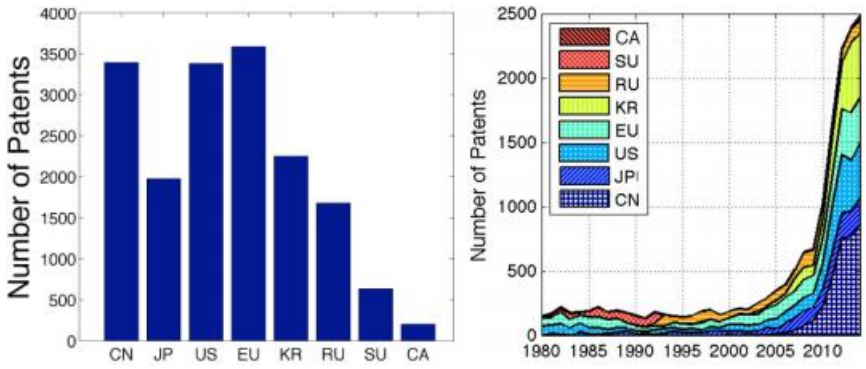

Fig. 4.e and 4.f: Wind power patents granted by all patenting offices (4.e) cumulative (4.f) over time (China = CN; Japan = JP; United States = US; EU = European Union 15; South Korea = KR; Russia = RU; Soviet Union = SU; Canada = CA)
Source: Lam (2017)

The wind power industry in China has gone from virtually no patents granted in 1980 to a somewhat limited number of total patents granted at the start of the century. Despite these 'slow' decades, this number has since then skyrocketed, as can be seen in figure 4.f above.

These two figures illustrate two important points. First, China had by the end of 2014 reached about 3500 wind power patents across all major licensed patenting offices around the world. This is equivalent to the United States and the EU-15. In addition, China has managed to bring itself ahead of important technological giants and regional adversaries such as Japan and South Korea. The second point is that most of the patents granted to China have primarily been given since around 2010. In this period the total number of patents granted across all countries rose dramatically. China has in the period from around 2010 and onwards been granted considerably more patents than other rivaling countries, which seemingly began their upsurge prior to China – starting from around 2005. During the period in which China experienced most of its increases in patent grants, it appears that second to China has been South Korea, after that the United States, and then the EU-15.

Despite the rising number of patent grants for China, these are mostly restricted to domestic patents while outside of China its activity in this domain remain very limited (Gosens & Lu 2013; Lam 2017). Furthermore, in addition to simple patent grant count, patent citation can work as an indicator of whether the patents possess any innovative quality. In this regard, several authors (Lam 2017; Zhou et al. 2018) claim that Chinese patents are a step behind in terms of patent citation. This might reflect weaknesses of Chinese patents or within the Chinese patent system itself.

For the solar power industry China is seemingly at the forefront. Since 2010, more than 50% of patent applications were Chinese. This number increased even further to 90% in 2015 (Yang et al., 2018). Thus, for both the solar and wind industry, Chinese innovation is seemingly very active. The quality of which is however more doubtful.

The increase in Chinese patent grants speaks well to the effects of increased investments and R&D spending within renewable energy by China. Thus, it seems that there is an ongoing innovation process in China within both the wind and solar power sector. If these innovations are substantial, then they can contribute to economic growth by enhancing productivity and setting the foundation for increased exports.

4.4.5 Exports of Renewable Energy Products

Global trade in renewable energy technologies before 2000 was almost nonexistent but has since then intensified (Groba & Cao, 2015). In 2005 Chinese wind turbine manufactures still only supplied 1.3% of the global turbine demand but by 2011 five out of the top ten global wind turbine manufactures were from China (Gosens & Lu, 2013: 234-35). Similarly, in 2011, seven out the top ten solar module manufacturers in the world were also from China. These seven companies had a combined share of global module production of 43.9% which was a rise from only 7% in 2005 (Cahoy et al., 2017: 230).

China's export of renewable energy products has increased rapidly and in 2016 it reached $83.4 billion. This effectively made China the number one exporting country of renewable energy products with a total market share of 24.31%. (Cao et al., 2018: 1). The export of renewable energy products by China between 2007 and 2016 can be divided according to a total of five different technological complexity classifications. That is, high-tech complexity, medium-high technical complexity, medium-tech complexity, medium-low technical complexity, and low-tech complexity. The annual average of China's renewable energy export shares is respectively 4.58%, 50.28%, 25.29%, 16.01%, and 3.84%. (Cao et al., 2018: 6). That is, more than half of the Chinese exported renewable energy products can be classified as possessing medium-high technical complexity. This means that China still does not on average possess the same level of product complexity, such as Denmark, a global frontrunner in the wind power industry. Nevertheless, Cao et al. (2018: 9) express that the numbers are "indicating that the overall technical level of China's REPs is constantly improving". Thus, the trend for China is clear, the cumulative exports are growing while the complexity of products is improving.

4.4.6 Encouraging Results with Minor Deficiencies

As shown, China's ambitions regarding its investments are very high. This consequently means that the expectations of returns on investments are correspondingly high. The results presented under the heading of green outcomes are predominantly positive. However, some results are arguably mixed and can therefore be interpreted accordingly.

The results for mitigation are generally encouraging. Prices for wind and solar energy are at an all-time low and this trend will seemingly continue for decades to come. This means that investing in these energy sources can now increasingly be deemed worthy investments for concerns purely related to the mitigation of climate change. This trend has obviously to some extent been driven by

the large investments of China, which have reduced prices significantly due to economies of scale effects. Furthermore, the investments have been translated directly into large increases in renewable energy capacity for China, which have seen a noteworthy rise in the capacity for wind power since around 2009 and for solar power around 2013. The increases in different types of renewable capacities reflect the direction of green investments by China. The renewable capacity mix in China is, however, still largely dominated by hydropower. Nevertheless, in 2014 China alone accounted for 31% of all wind power capacity in the world while the number was 16% for solar power. This evidently illustrates the growing attention of the Chinese government to especially these two types of renewables, and the growing mitigation potential created by this transition.

The composition of energy production and consumption indicates that China has made significant progress in terms of lowering its dependency on coal and increasing the utilization of renewable energy sources. This transition is important for China, not only in terms of mitigation but also as a long-term strategy to maintain the internal energy security of the country, which of course also plays a significant role in the Chinese government's strategic turn to renewable energy.

The tendency, however, also seems promising for mitigation. From 2011 to 2016, the share of coal as a source for energy consumption has gone from 70.2% to 62% while the share of renewable energy sources have risen from 8.4% to 13.3%. This is a positive step in the right direction but because the total energy consumption for the same period also has grown, it consequently means that numbers for coal appear more encouraging than they ought to be interpreted while the numbers for renewables, however, appear less satisfying than the reality they represent. In addition, the discrepancy between production and consumption of renewable energy might indicate that China has some difficulties utilizing the maximum effect of its renewable energy sources. This can be due to problems stemming from troubles of integration with the main grid in China or complications related to energy storage. These difficulties might slow the transition from coal to renewable energy but can potentially be offset in the future through innovation in this domain.

As shown in previous sections, the 12th Five Year Plan sets out several targets in relation to climate change mitigation of which the use of non-fossil fuels, as a source of energy, is an integral part. In this regard, China was aiming for 11.4% of the consumed energy to have been provided for by renewable energy sources. At the end of 2014, the result fell just short of its intended target as the official figures showed 11.3%. Nonetheless, in this regard there is a strong correlation between the intentions of the CCP and the outcomes of its strategic actions.

Turning to the economic aspects of the green outcomes, the results are encouraging but mixed as well. During China's economic rise, China has used its comparative advantage of relatively cheap labor to produce products at a very low cost. This low-cost labor advantage combined with its sheer geographical attributes has been used to produce in bulk. This has turned China into the world's manufacturer of low-cost goods. However, China's low-cost labor advantage is slowly waning due to rising wages which increase production costs. To advance economically, China must commence on a process of industrial upgrading to products with more value-added. In a slick sentence used as headline for several news articles, China must go from 'Made in China' to 'Created in China'. That is, China needs to substitute its slowly diminishing comparative advantage of low-cost labor with a competitive advantage arising from technological progress through innovation to produce high-value products that can be patented and traded.

In terms of patents, the fast-rising numbers of patent applications and grants within China indicate that the intensified investments in especially research & development within renewable energy is paying off. However, some researchers point out that the patents within wind power are mainly confined within the borders of China, and that Chinese patents lack citations compared to patents from Europe and the United States. This might reflect that while China evidently has become a world leader in terms of investments within wind power, it nevertheless suffers from the disadvantages of being a latecomer, and now seemingly plays a game of catching up rather than leading the way. As Lewis (2012: 145) contemplates "[w]hile there are many potential benefits to local wind manufacturing, there are also significant barriers to entry into an industry containing companies that have been manufacturing wind turbines for more than twenty years". Nonetheless, the massive investments in terms of R&D spending within renewables by the Chinese government has indeed led to an immense upsurge of Chinese patent application and grants. This is true for the wind power industry but is especially evident in the solar power industry where China seemingly has a starring role. Thus, it seems that while China in some ways is trying to catch up, its massive investments are actually slowly counterbalancing the negative effects of its late entry.

The results are very positive in terms of China's exports of renewable energy products. Both in terms of wind power and solar power, China has gone from being virtually nonexistent in global trade figures in 2005 to dominating the field in 2011. In this year, more than half of the world's top 10 manufactures within both solar and wind power resided in China.

The green outcomes clearly indicate that there exist challenges for China in terms of extracting the full potential of its renewable energy sources and creating the most groundbreaking innovations

within renewable energy products. However, there is a strong correlation between the expected targets of the CCP, in relation to the employment of non-fossil fuels in the Chinese energy consumption mix and its current results. Furthermore, the wind and solar power manufacturers in China have practically taken over in terms of market shares, which evidently illustrate that the level of sophistication and complexity of products are in line with market demands.

The green outcomes suggest that the causal mechanism taking place in China within renewable energy possess great endurability. That is, the domestic economic processes in which a green growth rationality spurred by systemic stimuli seem to be sufficiently successful to warrant sustained investments or even expanding on these investments. Economic growth is, however, never linear, and will accordingly suffer from setbacks which might slow the current transition. An example of this could be the current trade war with the United States which might put the transition under pressure. The Chinese government, however, seems very consistent in its willingness to pursue its clearly defined strategic goals, and it is this long-term determinacy that can prove to be the determinant of which country will be the global leader in renewables.

3rd Proposition

The third proposition holds that: *These domestic economic processes have strengthened China's commitment to the Paris Agreement.* The domestic economic processes refer to the increased investments and R&D spending within renewables, and the subsequent outcomes of these investments. These processes can be conceptualized as an iterative causal mechanism in which the success of investments i.e. green outcomes warrant sustained investments.

4.5 China's Commitment to the Paris Agreement

China met its carbon intensity target of 2020 already in 2017 and are well on its way to meeting its 2020 target of limiting its use of fossil-fuels (CAT, 2018). Furthermore, China has as part of its nationally determined contributions, in accordance with the Paris Agreement, set forth the target to peak CO2 emission by 2030. This stance towards climate change cooperation is in stark contrast to China's previously held position in international climate change negotiations and with the statements of former supreme leader of the CCP, Hu Jintao, who said that China would not accept any binding targets of any sort (Giddens, 2009: 221). China has accordingly been portrayed as the obstructer of negotiations. Li (2016: 50) argues: "[a]t the Copenhagen Conference in 2009 (COP 15), China was also accused of blocking a more substantial agreement from being reached. The tide changed in this round of climate talks. China was lauded by both the domestic and foreign press for its active and constructive role in bringing the Paris Climate Summit to fruition". This view is consistently substantiated by most literature on the subject. That is, the majority of scholars studying the Chinese stance on climate change cooperation emphasize the dramatic shift in China's position from obstructer in 2009 to enabler in 2015 (Hilton & Kerr, 2017; Kwon & Hanlon, 2015; Zhang, 2017).

China's changing position in relation to climate change cooperation coincides with its turn to a green growth economic rationality, which have led to massive investments in renewable energy. These green investments have in turn generated generally positive green outcomes. Therefore, to understand the Chinese commitment to the Paris Agreement, which is characterized by a shift from obstructer to enabler of international climate change cooperation, it is necessary to understand the strategic shift in Chinese domestic economic affairs.

4.6 Connecting the Dots

The previous chapters have shown how systemic stimuli have prompted specific domestic economic processes. Furthermore, the study is founded on the assumption that foreign policy is always to some degree an extension of domestic politics. Nevertheless, to conclude the argument, the relationship between these domestic processes and China's commitment to the Paris Agreement needs further scrutiny.

The relationship between domestic economic processes and China's commitment, as stipulated by neoclassical realism, is direct but not primary. That is, the most basic comprehension of the shift in the Chinese stance in climate change negotiations, which entails the choice of the Chinese leadership to participate and commit itself to the Paris Agreement, is to observe the systemic changes connected to climate change cooperation. Consequently, this also means that the domestic economic processes are contingent on the systemic stimuli. This essentially means that if there is a reduction in intensity of the systemic stimuli, then it should follow that the incentive to follow the logic derived from these stimuli will diminish. That is, if for example the global transition towards a green economy slows down or reverses, then the markets for renewable energy products will be reduced accordingly. Thus, the choice of the United States to withdraw from the Paris Agreement consequently means that Chinese export markets might become smaller. However, the potential for penetrating the existing markets nevertheless becomes bigger – as China's main competitor withdraw from the competition. From a mitigation perspective, however, there is only a negative aspect of American withdrawal in terms of limiting global emissions. Even so, there is no evidence that the global transition towards a green economy should reverse.

By observing changes at the system level, two trends are very visible. First, China's rise signifies increased ambitions that warrants continued economic growth. Second, climate change possesses both threats and opportunities for economic growth. Thus, a foreign policy response in which China chooses to participate in global cooperation that has the potential to mitigate the threats inherent in climate change seems appropriate. While this answer seems justifiable, it is nevertheless to some extent unsatisfiable as it only deals with one systemic factor - the threat incentive. Therefore, to fully understand the relationship between the independent variables at the system level and the foreign policy outcome, it is imperative to unfold the intervening variables at the domestic level. The framework presented throughout the thesis essentially presents systemic stimuli as spurring action in form of green investments. These investments, in turn, cause green outcomes, the success of which determines the iterative effect of the domestic economic processes.

The perceptions of systemic stimuli illustrate that an awareness of the threats and opportunities present under climate change were already emerging before the Conference of the Parties in Copenhagen in 2009. However, this only signifies the emergence of a green growth rationality in which economic interests and environmental considerations jointly form the basis for strategic actions. Consequently, this were only the beginning of specific domestic economic processes of which the end result was still unknown. This also means that the Chinese leadership were not ready to make any substantive guarantees in terms of climate change mitigation efforts, and only later when the results of Chinese climate change actions were starting to show, the Chinese willingness to cooperate on climate change mitigation increased accordingly.

The outcomes of green investments are in general positive. That is, while the outcomes have some deficiencies, they nonetheless show that despite the fact that China is a latecomer, China has been able to counterweight the weakness of being a latecomer through heavy overall investments and increased R&D spending. These encouraging results speaks to the endurability of the Chinese green growth rationality. In addition, there is a strong connection between the intentions of the CCP and its actions, which adds extensively to the credibility of current commitments.

The domestic economic processes discussed have intensified in the build-up towards the Paris Agreement. However, other factors have unquestionably also been conducive to this outcome. Thus, many factors can be said to be conducive to the Chinese commitment to the Paris Agreement. Some factors does, however, play a preeminent role. That is, while it may be worthwhile considering for example the reputational benefits of contributing positively to climate change cooperation, such as the Chinese desire to be acknowledged as a responsible stakeholder, who does not pose a threat to the international society, this factor alone cannot explain the Chinese commitment to the Paris Agreement. To elucidate, despite the fact that the Chinese leadership has been exposed to harsh criticisms after it became the largest energy consumer and the largest CO2 emitter in the world, and thus longing for positive acknowledgement from the outside world, it nonetheless remains that if there were no potential for economic growth and mitigation of the negative consequences of climate change but only reputational benefits to gain from participating in the Paris Agreement, then the cost of adjusting to the goals of the agreement would simply be too high vis-á-vis the expected gains. On the contrary, without the reputational benefits of participation, the economic and mitigation outcomes are sufficient to explain Chinese participation. Thus, reputational benefits can at best be considered an auxiliary cause of the changed Chinese position regarding climate change.

Evidence points to the fact that China pursues economic growth through innovation in the renewable energy sector. This indicates that China's interests are characterized both by a desire to grow economically but also to mitigate the negative effects of climate change. However, this does not specify which threats that work as drivers for the mitigative efforts. These threats are multifaceted, and what drives Chinese action is undoubtedly a configuration of threats. Nonetheless, using an economic perspective based on a green growth rationality to understand Chinese climate change actions makes analytical sense as it tackles all threats and economic opportunities of climate change simultaneously.

The domestic economic processes within China have strengthened China's commitment to the Paris Agreement. This is because the agreement is based on nationally determined contributions, which as the name suggests, are contributions aligned with national interests. Thus, the Chinese contributions to the Paris Agreement is a direct reflection of its national interests and current economic trajectory. This trajectory has, however, been characterized by a green growth rationality, which encompasses green investments that lead to green outcomes. The national interests of China have thus to a certain extent been in alignment with the goals of the Paris Agreement and vice versa.

Without the emergence of a green growth rationality within the Chinese leadership, its dedication to climate change cooperation seems more doubtful. This green growth rationality aligns systemic stimuli and Chinese national interests. That is, economic growth is a necessary component for the continued development of China. The current development stage of China is characterized by the industrialization process which have taken place within China since 1978. However, to continue its development path, China needs industrial upgrading. Thus, under the current influence of climate change, a green growth rationality has emerged. This rationality has spurred the Chinese leadership to invest heavily in renewable energy sources, such as wind and solar power, from around year 2009 and onwards. These green investments have led to positive results for China in terms of reducing its dependency on coal while increasing its reliance on renewables. Furthermore, the renewable energy sector has proven to be an avenue for innovation and increased exports. Consequently, most of the world's leading manufactures within solar and wind power are now from China.

If a green growth rationality had not existed in China or it had not obtained the expected results, then Chinese engagement in international cooperation on climate change would be more doubtful. Thus, domestic economic processes – as conceived through a transition towards renewable energy, have paved the way and strengthened the Chinese commitment to the Paris Agreement.

4.7 The Road Ahead

China is as shown projected to reach both its 2020 and 2030 targets before time. Thus, currently it seems that China follows the same path which have led to the Chinese choice of signing and ratifying the Paris Agreement. Furthermore, there is evidently a strong connection between the intentions of the Chinese Communist Party and its actions. Consequently, it can be expected that China until 2020 follow through on the commitment laid forth in the current Five-Year Plan.

The thirteenth five-year plan, which is the current FYP, emphasizes lengthily that the primary driver for development is innovation while innovation-driven development entails that production will move towards medium-high end products (NDRC, 2016). The 13th five-year plan also re-emphasizes the need for low-carbon technologies and products. This represents a new model for modernization in which humanity develops in harmony with nature (NDRC, 2016).

For these ends to be realized, among other targets, the 13th five-year plan anticipates research & development to reach 2.5% (as percentage of GDP) in 2020. While non-fossil energy (as percentage of primary consumption) must reach 15%.

The 13th Five-Year plan is thus an expansion of its two previous plans. This means that evidence points to the fact that China is on a path towards dominance within the green economy. Until now, the results of its heavy investments within the renewable energy sector have been predominantly positive. This suggests that the Chinese leadership will continue to make green investments. The result of which, however, determines the longevity of the green growth rationality.

Conclusion

Climate change is one of the most pressing issues of our times in international politics. Therefore, to understand the motivations that drive Chinese action on climate change deserves much attention.

The main research question for this thesis is: Why and how are domestic economic processes conducive to the Chinese commitment to the Paris Agreement. The short answer to this question is that the domestic economic processes in China are currently characterized by a green growth rationality which spur the Chinese leadership to make green investments, which in turn generate green outcomes. These outcomes have properties that are contributing to both economic growth and climate change mitigation. Thus, as these domestic economic processes are already in place, it means that the cost of participation in international climate change cooperation is low. That is, the Chinese commitments to the Paris Agreement is simply an extension of its domestic politics.

The research question has been answered by assessing three distinctive propositions, each containing a specific aspect in relation to the question at hand. The first proposition comprises how and why the domestic economic processes have been initiated. The second proposition concerns the endurability of these processes. While the last proposition links the domestic economic processes to China's commitment to the Paris Agreement.

Climate change is a systemic change in which both opportunities and threats emerge for all nations in the international system. The systemic changes are characterized by a global economic transition towards a green economy, global warming, and a rising China. Global warming signifies increased environmental, social, and economic threats. While the global economic transition towards a green economy represents economic opportunities within green industries, such as renewable energy. Furthermore, during China's rise, its ambitions have expanded accordingly. This has inclined China to maintain it economic growth to keep expanding its international influence. These different systemic incentives essentially means that climate change possesses both threats and opportunities to the continuation of economic growth in China.

Under the current conditions of climate change, China has chosen to green investments in renewables. China has invested heavily in renewable energy sources, such as wind and solar power since 2009, which in turn, have generated green outcomes that accommodate both environmental and economic concerns. Specifically, China has been able to, albeit slowly, reduce its coal dependency

and substitute it for renewable energy. Moreover, the increased investments and R&D spending within the renewable energy sector have also led to global reductions in prices of wind and solar power, increased the number of Chinese patents filed and granted within the sector, led to a massive upsurge in exports of Chinese renewable energy products, and effectively made China the leading manufacturer of the world within the industry. These developments have characterized China's domestic economic processes in the build up to the Paris Agreement. A large part of the positive Chinese engagement in international climate change cooperation can therefore be attributed to these specific processes.

The domestic economic processes have been conducive to China's commitment to the Paris Agreement because the processes correspond with the goals of the Paris Agreement. Moreover, the inherent nature of the Paris Agreement is encouraging for participation in correspondence with the Parties' national agendas working as the drivers of action, as the agreement is grounded in the concept of nationally determined contributions, and as such, these contributions will always to some extent reflect domestic politics. Thus, without these domestic economic processes, the Chinese commitment to the agreement seems rather unlikely and hard to explain. This, however, speaks well to the future of Chinese commitment to climate change cooperation. That is, the Chinese leadership are very consistent in its strategic planning. This is reflected in the correlation between intentions, action, and outcomes. Furthermore, China has been able to counterweight the negative effects of its late entry within the renewable energy sector by investing rather vigorously. This has proven to be a success for China, and Chinese manufactures are currently dominating the industry, while Chinese patent grants and applications within renewable energy have risen accordingly. This suggests ongoing innovation are taking place within China. Moreover, the targets concerning renewable energy supply to the domestic consumption are generally being met and the renewable energy capacity of China is surging. The encouraging green outcomes lead to the expectation that these domestic economic processes possess strong endurability and consequently Chinese commitment to the Paris Agreement will persist.

The choice of China to sign and ratify the Paris Agreement is a decision, which without a doubt has been made with several multiple interests in mind. It is, however, safe to assume that without the current domestic economic processes taking place in China, the agreement would probably not have been endorsed by the Chinese government. Thus, the signing of the Paris Agreement is by and large the result of domestic interests, the economic opportunities and threats present within the context of climate change, and the current economic development taking place

within China. Nevertheless, the fact that China can simultaneously realize its auxiliary goals, such as being perceived increasingly as a responsible international stakeholder and assisting the global efforts of climate change mitigation, does indeed further strengthen the Chinese commitment to the accord.

The domestic economic processes characterized by a green growth rationality has been predominantly successful so far, which speaks to the endurability of these processes. However, the preeminence of domestic economic factors to explain China's commitment to the Paris Agreement means that while the shift in the Chinese position in climate change cooperation has been much applauded, it nevertheless seems highly doubtful that China's climate change commitments on the international stage will be anything more than a mirror image of its domestic targets.

For policymakers and others interested in the mitigation of climate change through a reduction of CO2 emissions there are two very encouraging things to take away from this. That is, there is a silver lining to the seemingly discouraging circumstance that Chinese participation in international climate change cooperation is steered by its domestic economic policies. First and foremost, China has made incredible developments within the sector of renewable energy. This means that the current economic processes within China seems to endure. Second, there is an ongoing global transition towards a green economy, which does not seem to be slowing down. This means that while China already can boast of possessing many of the leading manufacturers within renewables and the largest export sector in the world, the markets for renewable energy products are constantly expanding. Consequently, the potential for economic growth expands accordingly. This necessarily means that the Chinese leadership will go long to fulfil its goals of economic growth, which as stipulated by systemic incentives will through green investments, such as renewable energy.

Bibliography

Armstrong, Martin (2017) *"The Race for Renewable Energy Domination"*, May 31, Web https://www.statista.com/chart/9284/the-race-for-renewable-energy-domination/ <accessed 20-11-2018>

Blatter, Joachim & Haverland, Markus (2014) *Designing case studies*, New York: Palgrave Macmillan

Cao, Jing & Groba, Felix (2013) *"Chinese Renewable Energy Technology Export: The Role of Policy, Innovation and Markets",* DIW Berlin, Germen Institute for Economic Research, Discussion Papers

Cao, Xuping; Rajarshi, Aroskar & Tong, Juxi (2018) *"Technology Evolution of China's Export of Renewable Energy Products"*, International Journal of Environmental Research and Public Health

Cahoy, Daniel R.; Lei, Zhen; Meng, Yuxi & Blumsack, Seth (2017) *"Global Patent Chokepoints"* Stanford Technology Law Review, Vol. 20, pp. 213-244

CBI [Confederation of British Industry's] (2011*) "China's Twelth Five Year Plan (2011-2015) – the Full English Version"*, May 11, Web https://cbi.typepad.com/china_direct/2011/05/chinas-twelfth-five-new-plan-the-full-english-version.html <accessed 19-10-2018>

CEF (n.d.) "What is environmental degradation?", Web https://www.conserve-energy-future.com/causes-and-effects-of-environmental-degradation.php <accessed 30-10-2018>

CAT [Climate Action Tracker] (2018) "Country Summary – China", Web https://climateactiontracker.org/countries/china/ <accessed 09-10-2018>

Cox, Robert W. (1981) *"Social Forces, States, and World Orders: Beyond International Relations Theory",* Millennium – Journal of International Studies, 10; 126

Dequech, David (2007) *"Neoclassical, mainstream, orthodox, and heterodox economics"* Journal of Post Keynesian Economics, 30:2, 279-302

ECB [European Central Bank] (2017) *"How does innovation lead to growth?",* June 27, Web. https://www.ecb.europa.eu/explainers/tell-me-more/html/growth.en.html <accessed 01-12-2018>

Economy, Elizabeth C. (2013) "The Environment" in *Handbook of China's Governance and Domestic Politics*, London: Routledge

EDF [Environmental Defense Fund] (n.d.) "How climate change plunders the planet", Web https://www.edf.org/climate/how-climate-change-plunders-planet <accessed 07-10-2018>

Engel, Susan N. (2010) "Development economics: from classical to critical analysis" in *The International Studies Encyclopedia Volume II*, pp. 874-892, West Sussex, Blackwell Publishing

Evera, Stephen V. (1997) *Guide to Methods for Students of Political Science,* New York, Cornell University Press

Fialka, John (2016) *"Why China Is Dominating the Solar Industry",* December 19, Web https://www.scientificamerican.com/article/why-china-is-dominating-the-solar-industry/ <accessed 21-11-2018>

Francois, Patrick; Trebbi, Francesco & Xiao, Kairong (2016) *"Factions in Nondemocracies: Theory and Evidence from the Chinese Communist Party"*, October, NBER Working Papers, National Bureau of Economic Research

FS-UNEP [Frankfurt School-United Nations Environment Programme] (2013) *"Global Trends in Renewable Energy Investment 2013"*, Bloomberg New Energy Finance

FS-UNEP [Frankfurt School-United Nations Environment Programme] (2014) *"Global Trends in Renewable Energy Investment 2014"*, Bloomberg New Energy Finance

FS-UNEP [Frankfurt School-United Nations Environment Programme] (2015) *"Global Trends in Renewable Energy Investment 2015"*, Bloomberg New Energy Finance

FS-UNEP [Frankfurt School-United Nations Environment Programme] (2016) *"Global Trends in Renewable Energy Investment 2016"*, Bloomberg New Energy Finance

Gao, Yun (2016) *"China's response to climate change issues after Paris Climate Change Conference",* Advances in Climate Change Research 7, pp. 235-240

Gerring, John (2004) *"What Is a Case Study and What Is It Good for?",* Boston University American Political Science Review, Vol. 98, No. 2.

Gerring, John (2005) *"Causation – A Unified Framework for the Social Sciences"*, Journal of Theoretical Politics 17(2): 163-198

Giddens, Anthony (2009) *The Politics of Climate Change*, Oxford: Polity Press

Godbole, Avinash (2016) *"Paris Accord and China's Climate Change Strategy"*, India Quarterly 72(4) 361-374, Sage Publications

Goodrich, Alan C.; Powell, Douglas M.; James, Ted L.; Woodhouse, Michael & Buonassisi, Tonio (2013) *"Assessing the drivers of regional trends in solar photovoltaic manufacturing"* Energy Environment Sci. Vol. 6., pp. 2811-2821

Gosens, Jorrit & Lu, Yonglong (2013) *"From lagging to leading? Technological innovation systems in emerging economies and the case of Chinese wind power"* Energy Policy 60, pp. 234-250

Heakal, Reem (2018) *"What are economies of scale?"*, January 15, Web https://www.investopedia.com/insights/what-are-economies-of-scale/ <accessed 29-10-2018>

Heffron, Daniel (2015) *"What do realists think about climate change?"* Centre for Geopolitics & Security in Realism Studies

Hilton, Isabel & Kerr, Oliver (2017) *"The Paris Agreement: China's 'New Normal' role in international climate negotiations"*, Climate Policy, 17:1, pp. 48-58

IEA [International Energy Agency] (2017a) *"The 11th five-year plan for economic and social development of the people's republic of china (2006-2010)",* May 22, Web https://www.iea.org/policiesandmeasures/pams/china/name-24104-en.php <accessed 24-11-2018>

IEA [International Energy Agency] (2017b) *"Renewables 2017: China is the undisputed renewable growth leader",* October 4, Web https://www.iea.org/publications/renewables2017/#section-1-4 <accessed 20-11-2018>

IRENA [International Renewable Energy Agency] (2015) *"IRENA Renewable Energy Capacity Statistics 2015"*, June, Web https://www.irena.org/publications/2015/Jun/Renewable-Energy-Capacity-Statistics-2015 <accessed 20-11-2018>

IRENA [International Renewable Energy Agency] (2017) *"Country: China"*, Web http://resourceirena.irena.org/gateway/countrySearch/?countryCode=CHN <accessed 20-11-2018>

IRENA [International Renewable Energy Agency] (2018) *"Renewable Capacity Statistics 2018"*, March, Web https://www.irena.org/publications/2018/Mar/Renewable-Capacity-Statistics-2018 <accessed 20-11-2018)

Kenton, Will (2018) *"Industrialization"*, April 7, Web https://www.investopedia.com/terms/i/industrialization.asp <accessed 01-11-2018>

Keohane, Robert O. & Victor, David G. (2016) *"Cooperation and discord in global climate policy",* Nature Climate Change, Vol. 6, June 2016

Kissinger, Henry A. (1966) *"Domestic Structure and Foreign Policy",* Daedalus, Vol. 95, No. 2, Conditions of World Order, Spring, pp. 503-529, MIT Press: American Academy of Arts and Sciences

Kitchen, Nicholas (2010) *"Systemic pressures and domestic ideas: a neoclassical realist model of grand strategy formation",* Review of international studies, 36 (1), pp. 117-143

Kopra, Sanna (2012) *"A Responsible Developing Country: China's International Image Building and International Negotiations on Climate",* Quarterly Journal of Chinese Studies, 1(3), pp. 121-137

Kwon, Kyae Lim & Hanlon, Robert J. (2015) *"A comparative review for understanding elite interest and climate change policy in China",* Environ Dev Sustain, 18:1177-1193

Lam, Long Thang (2017) *"Innovation in China's Renewable Energy Industry",* Ph.D. Dissertation

Landberg, Reed & Hirtenstein, Anna (2018) *"Coal Is Being Squeezed Out of Power by Cheap Renewables",* Web https://www.bloomberg.com/news/articles/2018-06-19/coal-is-being-squeezed-out-of-power-industry-by-cheap-renewables <accessed 21-11-2018>

Levy, Jack S. (2015) *"Counterfactuals, Causal Inference, and Historical Analysis"*, Security Studies, 24:3, pp. 378-402

Lewis, Joanna I (2012) *Green Innovation in China: China's Wind Power Industry and the Global Transition to a Low-Carbon Economy*, Columbia University Press

Li, Anthony H. F. (2016) *"Hopes of Limiting Global Warming?" China and the Paris Agreement on Climate Change",* China Perspectives, No. 1 (105) pp. 49-54

Lieberman, Marvin B. & Montgomery, David B. (1988) *"First-Mover Advantages",* Strategic Management Journal, Vol. 9, pp. 41-58

Lobell, Steven E.; Ripsman, Norrin M. & Taliaferro, Jeffrey W. (2009) *Neoclassical Realism, the State, and Foreign Policy,* Cambridge: Cambridge University Press

Mearsheimer, John J. (2006) "Structural Realism" in *International Relations Theories: Discipline and Diversity,* Ed. Dunne, Tim; Kurki, Milja & Smith, Steve, Oxford University Press, pp. 71-88

Milborrow, David (2018) *"At the tipping point: 2017 wind cost analysis",* Web https://www.windpowermonthly.com/article/1455361/tipping-point-2017-wind-cost-analysis <accessed 21-11-2018>

Minqi, Li (2014) *Peak Oil, Climate change, and the Limits to China's Economic Growth*, London: Routledge

Mochizuki, Junko & ZhongXiang Zhang (2011) *"Environmental Security and its Implications for China's Foreign Relations",* Web. https://ageconsearch.umn.edu/record/102508/files/NDL2011-030.pdf <accessed 20-11-2018>

NBSC (2017) [National Bureau of Statistics of China] in China Statistical Yearbook 2017 *"Total Production of Energy and Its Composition"*, Web http://www.stats.gov.cn/tjsj/ndsj/2017/indexeh.htm <accessed 19-11-2018>

NDRC [National Development and Reform Commission] (2006) *"The 11th Five-Year Plan: targets, paths, and policy orientation",* March 19, by Ma Kai, Chairman, NDRC, Web http://en.ndrc.gov.cn/newsrelease/200603/t20060323_63813.html <accessed 24-11-2018>

NDRC [National Development and Reform Commission] (2016) "Chapter 3 Major Objectives"; "Chapter 4 The Development Philosophy"; and "Chapter 46 Respond to Global Climate Change" in *the 13th Five-Year Plan: For economic and social development of the People's republic in China*

(2016-2020), Web. http://en.ndrc.gov.cn/newsrelease/201612/P020161207645765233498.pdf <accessed 24-11-2018>

OECD [Organization for Co-operation and Development] (n.d.) *"Gross domestic spending on R&D"*, Web https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm <accessed 20-11-2018>

OECD [Organization for Co-operation and Development] (2007) *"Innovation and Growth – Rationale for an Innovation Strategy"*, Web. https://www.oecd.org/sti/inno/39374789.pdf <accessed 13-11-2018>

OECD [Organization for Co-operation and Development] (2017) "*Green Growth Indicators 2016"*, Web https://www.oecd-ilibrary.org/environment/green-growth-indicators-2017_9789264268586-en <accessed 16-12-2018>

Potocnik, Janez (2011) *"Towards a global transition to a green economy"*, May 11, New York

Ripsman, Norrin M. (2011) *"Neoclassical Realism"*, June, Web http://internationalstudies.oxfordre.com/view/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-36 <accessed 23-10-2018>

Ritchie, Hannah & Roser, Max (2018) *"Energy Production & Changing Energy Sources",* Web https://ourworldindata.org/energy-production-and-changing-energy-sources#investment-in-renewable-technologies <accessed 20-11-2018>

Rose, Gideon (1998) *"Neoclassical Realism and Theories of Foreign Policy",* World Politics, Vol. 51, No. 1, pp. 144-172, Cambridge University Press

Shellenberger, Michael (2018) *"If Solar and Wind Are So Cheap, Why Are They Making Electricity So Expensive?",* April 23, Web. https://www.forbes.com/sites/michaelshellenberger/2018/04/23/if-solar-and-wind-are-so-cheap-why-are-they-making-electricity-more-expensive/#414ced131dc6 <accessed 02-12-2018>

State Council (2011) “China’s Peaceful Development”, September 11, Web http://english.gov.cn/archive/white_paper/2014/09/09/content_281474986284646.htm <accessed 21-11-2018>

Stensdal, Iselin (2015) “China: every day is a winding road” in *The Domestic Politics of Global Climate Change*, Edward Elgar Publishing Limited

Sterling-Folker, Jennifer (1997) *“Realist Environment, Liberal Process, and Domestic-Level Variables”,* International Studies Quarterly, Vol. 41, No. 1, pp. 1-25

UNCTAD [United Nations Conference on Trade and Development] (2012) *“Engaging in the Transition to a Green Economy”*, Web https://unctad.org/meetings/en/Miscellaneous%20Documents/osg_2012_03_GreenEconomy_en.pdf <accessed 27-12-2018>

UNCTAD [United Nations Conference on Trade and Development] (2013) *“World Investment Report 2013: Global Value Chains: Investments and Trade for Development”*

UNESCO [United Nations Educational, Scientific and Cultural Organization] (n.d.) *“Science, Technology, Innovation: Gross domestic expenditure on research and development (R&D)”,* Web http://data.uis.unesco.org/Index.aspx?DataSetCode=SCN_DS&lang=en# <accessed 20-11-2018>

UNFCCC [United Nations Framework Convention on Climate Change] (2016) *“China First NDC”,* Web https://www4.unfccc.int/sites/NDCStaging/Pages/Party.aspx?party=CHN <accessed 10-10-2018>

UNFCCC [United Nations Framework Convention on Climate Change] (n.d.) *“Summary of the Paris Agreement”*, Web. https://bigpicture.unfccc.int/#content-the-paris-agreemen <accessed 12-09-2018>

UCS [Union of Concerned Scientists] (2018) *“Each Country’s Share of CO2 Emissions”,* October 11, Web https://www.ucsusa.org/global-warming/science-and-impacts/science/each-countrys-share-of-co2.html#.W7xpiugzbIU <accessed 09-10-2018)

Ward-Perkins, Zach & Earle, Joe (2013) *"Economics student need to be taught more than neoclassical theory"*, October 28, The Guardian, Web https://www.theguardian.com/commentisfree/2013/oct/28/economics-students-neoclassical-theory <accesses 29-11-2018>

WIPO [World Intellectual Property Organization] (2018) *"China Drives International Patent Applications to Record Heights; Demand Rising for Trademark and Industrial Design Protection"*, March 21, Web http://www.wipo.int/pressroom/en/articles/2018/article_0002.html <accessed 22-11-2018>

World Bank (n.d.a) *"GDP growth (annual %)",* Web https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2017&locations=CN&start=2002 <accessed 27-12-2018>

World Bank (n.d.b) *"Research and development expenditure (% of GDP)",* Web https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=CN-US <accessed 20-11-2018>

Yang, Li; Xiao, Cui; Qingyun, Liao & Changxin, Liu (2018) *"Analysis of Patent Intelligence of Solar Energy Technology in China in the Aspect of Global Competition"*, The Asian Conference on Sustainability, Energy & The Environment

Yu, Jie (2018) *"The belt and road initiative: domestic interests, bureaucratic politics and the EU-China relations",* March 28, Asia Eur J, 16:223-236

Zainal, Zaidah (2007) *"Case study as a research method"*, Jurnal Kemanusiaan, bil. 9, Jun 2007, Faculty of Management and Human Resource Development: Universiti Teknologi Malaysia

Zhang, ZhongXiang (2017) *"Are China's climate commitments in a post-Paris agreement sufficiently ambitious?"*, WIREs clim Change 8:e443

Zhou, Yuan; Pan, Meijuan & Urban, Frauke (2018) *"Comparing the International Knowledge Flow of China's Wind and Solar Photovoltaic (PV) Industries: Patent Analysis and Implications for Sustainable Development"*, June 5, Sustainability, Vol. 10, Issue 6: 1883