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Two-Level Games Analysis of Clean Development Mechanism (CDM) China's Policy in Realizing China's 2060 Net-Zero Goal

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Abstract

Originating from the redefinition of the Human Security approach as an alternative in mapping threats from individuals to social systems, such as climate change, a consciousness has emerged regarding the importance of climate balance for survival. This has also made it a global priority to focus attention on these issues. The objective of this research is to examine the dynamics of establishing China's Clean Development Mechanism (CDM) Policy as an implementation of the Paris Agreement commitment and the continuation of the Kyoto Protocol. The Two-Level Games theory introduced by Robert Putnam serves as the primary theoretical framework for this study. The research findings indicate that to achieve a win-set for CDM at the international level, strengthening diplomatic relations with the European Union is crucial, as a replacement for the leadership vacuum in the environmental regime following the United States' withdrawal. At the domestic level, the CDM win-set emphasizes the importance of support from coalitions and state institutions to provide a foundation for success. Ultimately, it becomes imperative to maximize the diplomatic process not only at the international level but also encompassing the domestic level, thereby enabling the comprehensive realization of "China's 2060 Net-Zero Goal".

Keywords: Climate Change, Two-Level Games, Clean Development Mechanism, 2060 Net-Zero Goal

INTRODUCTION

The redefinition of security studies, evolving concurrently with civilizational changes, has introduced the human security approach as an alternative framework to address threats endangering individuals and social groups within societal systems (Trihartono et al., 2020). The United Nations Development Program's Human Development Report of 2004 stated *"The concept of security must change-from an exclusive stress on national security to a much greater stress on people security, from security through armaments to security through human development, from territorial to food, employment and environmental security*" (UNDP, 2004). This definitional scope is closely aligned with human rights principles based on the values of freedom from want, fear, and the right to live in dignity.

In its evolution, the human security approach has given rise to new theories such as Securitization, conceptualized by Buzan, Waever, and Wilde from the Conflict and Peace Research Institute (COPRI), and further developed through the securitization dimension by the Copenhagen School (Yumirto & Sudirman, n.d.). Despite its significance in security studies, dynamic developments have led to modifications, such as Emmers' emphasis on the securitization process in speech act mechanisms that generate threats, threats that engender speech acts, and the notion of existential threats that revert securitized issues to their pre-securitized state (Trihartono et al., 2020).

Concurrent with these theoretical developments, the 19th century saw the emergence of intellectual roots for industrialization policies, which became intertwined with the political-economic aspects of mercantilism. This policy paradigm was adopted by numerous nations, transforming the political view of industrialization into a means of enhancing national economic welfare and self-sufficiency in an integrated manner (Rifdatul Hanifah & Muhammad Yasin, 2024). The advent of securitization theory has brought forth contrasting perspectives on

industrialization, with some viewing it as a contributor to environmental degradation, particularly through carbon emissions and greenhouse gases.

Greenhouse gases primarily refer to heat-absorbing and -emitting gases, including carbon dioxide, methane, and nitrous oxide (Hoornweg et al., 2011). While these gases occur naturally, human activities—notably the combustion of fossil fuels such as oil, natural gas, and coal—have become significant sources (Kweku et al., 2017). Other contributing factors include agriculture, food production, electricity generation, vehicle engines, industrial machinery, and various daily human activities (Information Unit Convention (ICU), 2000). The increase in greenhouse gas concentrations beyond nature's absorption capacity results in greater heat retention, leading to climate imbalances and impacting ecosystem health and sustainability.

This climate imbalance, known as climate change, poses a global threat to nature and humanity, becoming a priority on the international agenda. The Kyoto Protocol emerged as a response to greenhouse gas emissions, representing a legally binding agreement for developed countries to collectively reduce their emissions by 5.2%. Comprising 28 articles and two annexes, it stipulates reductions in anthropogenic greenhouse gas emissions (Makarenko, 2010). Makarenko's research identifies the greenhouse gases regulated by the Kyoto Protocol: Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF6), along with their emission sources such as energy, industrial processes, and waste management (Makarenko, 2010).

Addressing environmental issues through the Paris Agreement. This accord, resulting from the 21st Conference of the Parties (COP-21) to the UNFCCC, aims to limit global temperature increase to below two degrees Celsius above pre-industrial levels and to enhance nations' capacities to respond to climate change (*The Paris Agreement,* n.d.). The agreement employs a decentralized, bottom-up approach, allowing states to determine their contributions, known as Nationally Determined Contributions (NDCs) (Bodansky, 2017).

Bodansky notes that these NDCs are integral to achieving sustainable long-term emission goals, a key element absent from the Kyoto Protocol. Another distinction is the Paris Agreement's inclusion of all nations in greenhouse gas reduction efforts, not just developed countries. While 187 of 197 convention parties have ratified the agreement, the United States' withdrawal is regrettable (Bodansky, 2017).

China, as the largest CO2 emitter, has demonstrated responsibility in curbing its CO2 production. China's commitment is evidenced by a 48.4% reduction in carbon emissions per unit of gross domestic product compared to 2005 levels, surpassing the 40.0%–45.0% target (Xu et al., 2024). However, this progress has elicited divergent views. Pardede's research, focusing on "China's Road to Zero Hunger," cites DNV GL's prediction at the UN Private Sector Forum that China will not succeed in addressing climate change (Pardede, 2020). This perspective may be valid considering China's significant challenges in carbon reduction, including its 84.1% fossil fuel consumption in 2020, necessitating high-carbon energy and substantial emissions, coupled with rapid economic growth leading to high energy consumption(Xu et al., 2024). Undeterred by these perspectives, the Chinese government has strengthened its commitment. President Xi's pledge before the UN General Assembly in September 2020 to achieve peak CO2 emissions before 2030 and carbon neutrality before 2060 represents a significant top-down commitment (McGrath, 2020).

Given this background, the authors are interested in examining China's policies in addressing climate change. This issue is complex, considering China's status as a major nation with rapid civilizational progress that must simultaneously reduce CO2 production and participate in addressing environmental issues as a global threat, even committing to "China's 2060 Net-Zero Goal." Regarding the negative consequences of the international hegemonic situation, both aspects are situated amidst potential economic and political dominance with significant implications for the international order.

RESEARCH METHODS

This study employs a descriptive method with a qualitative approach, aimed at comprehending phenomena related to the experiences of the research object. This approach facilitates the understanding of perspectives, behaviors, patterns, and objectives of the subject by mapping them through narrative and language, as outlined in the methodology (Moleong, 2018)

Given China's extensive green policy initiatives across various periods, which have yielded favorable outcomes, it is compelling to conduct an in-depth investigation into the phenomenon of China's green policy orientation. The primary objective of this research is to examine the dynamics of formulation and implementation of China's green policy as a response to economic-political complexities and the influence of hegemonic dominance competition, viewed from both domestic and international perspectives.

The narrative developed in this research is based on secondary sources, including journals, articles, websites, reports, and other resources obtained through literature review. These sources are categorized to construct a systematic framework.

RESULT AND DISCUSSION

The Dynamics of China's Green Policy

China first incorporated green policies through "Environmental Protection" in its 5th Five-Year Plan (FYP) (1975-1980) (Phillips T, 2016). As the targets outlined in these policies were not fully realized, the policies were reviewed and reinforced every five years with in-depth technical planning regarding climate change issues. Considering the negative impacts and environmental threats posed by climate change, China ratified the Paris Agreement on September 3, 2016, to demonstrate its commitment (Xinhua, 2016). Moreover, the Standing Committee of the National People's Congress of China stated that the ratification of the Paris Agreement would assist the government in achieving sustainable development, such as low-carbon development, maintaining domestic security stability, and creating opportunities for China to play a role in global climate governance (Xinhua, 2016).

With the implementation of the Kyoto Protocol in 2005, China began to apply the Clean Development Mechanism (CDM), focusing on renewable energy, energy conservation and efficiency improvement, and the recycling and utilization of coal-bed methane (Shi et al., 2021). The CDM is a mechanism that enables Annex I and non-Annex I countries to collaborate in reducing gas emissions through "Clean Development" programs. Through CDM, Annex I countries can fulfill their mission to reduce gas emissions by assisting with "emission reduction" projects in non-Annex I countries. Non-Annex I and developing countries can receive financial and technological compensation from this relationship. Broadly, CDM aims to achieve market-based gas emission reductions, where developed countries invest in developing countries through various models (Addaney, 2018).

The CDM also aims to help developing or non-Annex I countries achieve sustainable development to reduce global emissions. These investments result in emission reductions that are certified, and Certified Emission Reduction (CER) credits are issued to Annex I countries. CERs can be sold and used by industrialized countries to meet their emission reduction targets. CDM project efforts are only recognized if the developing country has ratified the Kyoto Protocol; without participation in ratification, credits or certificate emission reductions cannot be granted. The implementation of China's CDM became evident from 2007 to 2012, particularly in 2012, when the number of China's newly registered CDM projects reached 1,819, accounting

for more than 56% of the global total of 3,233, demonstrating China's dominance in the CDM market (Shi et al., 2021).

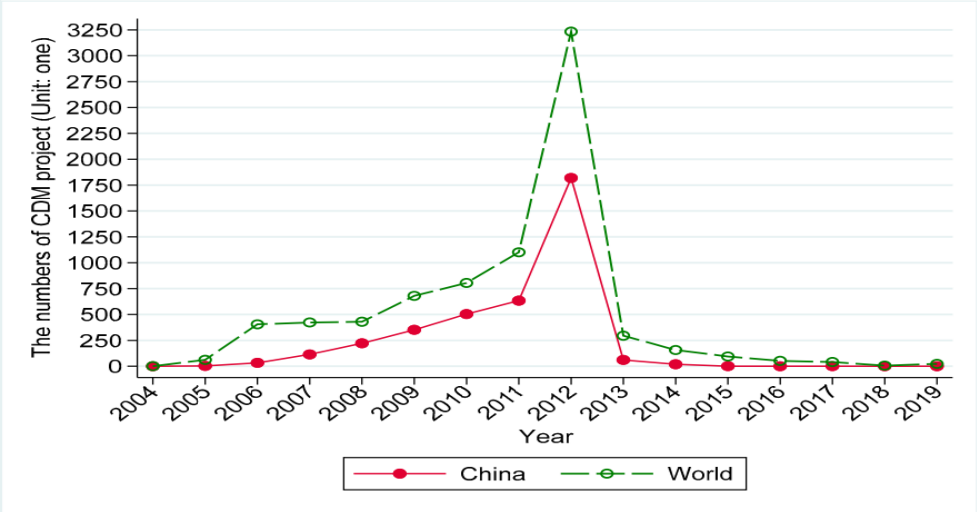

Figure 1. Number of CDM projects registered in China and the world (Shi et al., 2021).

Shi presented data in the research indicating that China's top three CDM projects were: new and renewable energy, energy conservation and efficiency improvement, and methane recycling and utilization. Out of a total of 1,264 projects, 1,553 were new and renewable energy projects, representing 81%, while the remaining 19% were other projects (Shi et al., 2021).

To further realize the objectives of the Paris Agreement, China's commitment can be observed in the 13th Five-Year Plan (2016-2020) policy. The 13th FYP reincorporated policy goals related to "Environmental Protection." The overarching aim for environmental protection in China's 13th FYP was to reduce carbon gas emissions by 40-45% by 2020 (Majid et al., 2022). To achieve this goal, China prioritized the core principles of innovative, open, green, coordinated, and inclusive growth (Taylor, 2020). China employed strategies in the 13th FYP, including: (1) 13th Five-Year Plan on Energy Development, aimed at controlling non-fossil energy consumption, where China had to limit energy source usage to less than 5 billion tons of standard coal by 2020 (Majid et al., 2022); ((2) 13th Five-Year Plan on Renewable Energy, aimed at increasing the target for clean energy usage to 15% by 2020 (Seligsohn & Hsu, 2016). This value was set as a target by raising the lower value of the 13th FYP, which was previously only 12% in the 12th FYP (Seligsohn & Hsu, 2016). In addition to limiting coal energy source consumption, the 13th FYP also prioritized combating air pollution and improving air quality, including a 15% reduction in NO2 (Nitrogen Oxide) and SO2 (Sulfur Dioxide) levels from ground transportation. This reduction required that all cities in China meet air quality standards for at least 80% of the time (SANDALOW, 2019).

International Level Win-Set (Level 1)

Sino – America Rivalry, Leadership?

China's strategies, including The New Type of Great Power Relations and Harmonious Asia, have been positively received by most nations. China's constructed identity has shifted to become a new power, offering an alternative to U.S. hegemony in the region. This shift has sparked contemporary debates on managing interests and conflicts between these two powers (Al Syahrin, 2018).

Sembayang et al (2024) in their study "Rationalization of the U.S.-China Trade War from the Perspective of Chicken Game Theory," found that the trade war between the U.S. and China resulted in economic costs for both nations, particularly affecting trade balances. Sembayang revealed that in terms of benefits, the U.S. aimed for hegemonic stability while China sought modified structural changes as political benefits amid the trade war. Their findings suggest that

it would be more rational for the U.S. to choose to "swerve," implying that U.S. protectionist policies should cease, while China was deemed to have greater economic capacity to continue straight (Sebayang et al., 2024).

Continuing the previous discussion on rivalry dynamics from international political and economic perspectives, China and the U.S., as the world's two largest industrial nations, are also the largest carbon emitters globally. These countries have engaged in environmental cooperation, marked by a bilateral agreement on Scientific and Technological Cooperation since 1979 (Wu & Xu, 2013). This agreement addressed environmental protection and energy issues, which was further prioritized in 2009 by President Obama with a focus on climate change.

However, the situation changed when the U.S. announced its withdrawal from the Paris Agreement. This move affected the foundation of international environmental governance, causing a crisis in global climate governance. The withdrawal of U.S. funding, as the largest donor for climate change research, caused concern among many parties (Yahya et al., 2022). Qimin Chai's research further reinforced this concern, stating that the U.S. withdrawal from the Paris Agreement negatively impacted the implementation of climate policies and increased global emissions reduction by 8.8-13.4%, also adversely affecting other countries' commitments (Chai et al., 2017).

In response to this dynamic, the European Union quickly positioned itself as a world leader in addressing climate change. This was reflected in the EU's implementation of policies and various internal work programs, as well as its active role in initiating climate change issues in international forums (Nathania, 2022).

Following Trump's decision, the EU encouraged China to fill the leadership vacuum on climate change issues. Chinese President Xi Jinping coordinated with French President Emmanuel Macron on narratives regarding climate change and biodiversity agreements (Boffey & Neslen, 2017). The 19th EU-China meeting in 2007 marked a new chapter in diplomatic relations between the two parties. EU Commissioner Miguel Arias Canete stated that both sides would participate in carbon trading and commit to clean energy use as outlined in the Paris Agreement (Liu et al., 2019).

The relationship between the two parties has continued to strengthen, as evidenced by ongoing collaborations such as the Ministerial on Climate Action (MoCA), International Civil Aviation Organization (ICAO), and International Maritime Organization (IMO) (Nathania, 2022). These collaborations primarily emphasize climate change mitigation to demonstrate leadership roles in projecting renewable and sustainable green technologies for the international community. The Paris Agreement has been implemented through CDM projects and Carbon Market initiatives.

The creation of cooperative projects between China and the EU through the high-level MoU on "Circular Economy" ensures that all economic activities will not produce waste (Ellen MacArthur Foundation, n.d.). By observing China's various cooperative communications with various countries, especially the EU, China's maximum benefit in achieving a win-set at the international level has been attained.

Domestic Level Win-set (Level II)

Clean Development Mechanism (CDM) China's Policy - China Certified Emission Reduction (CCER)

The majority of CDM projects in China are based on renewable energy, particularly wind power and hydroelectric power plants. This aligns with important aspects of the China Certified Emission Reduction (CCER) market, with projects often implemented in small-scale rural sources. Additionally, efforts to reduce emissions are made through urban waste management and reforestation.

Official project records compiled by Lo and Cong reveal differences in the distribution of validated CCER projects across operational locations and project categories. For instance,

Yunnan and Sichuan provinces are not major sources of project implementation, while Xinjiang and Hubei rank at the top (Lo & Cong, 2017). Western, central, and northern China remain popular locations for exploring balancing opportunities. More potential areas, especially those directly managed by local governments such as Shanghai and Tianjin, do not show a significant presence in industrial loss replacement through project submissions. The reduced contribution from eastern and northern coastal provinces like Zhejiang, Shandong, and Jiangsu, which were estimated to contribute 25% of all CDM projects in China, requires further attention (Lo & Cong, 2017).

According to Christine Tjhin, a China policy observer, most of China's power generation sector still relies on coal (Majid et al., 2022). As of 2018, coal-fired power plants in China accounted for 50% of the total at the international level (YOU, n.d.). The Secretary-General of China's National Development and Reform Commission stated that environmentally friendly energy has weaknesses in terms of resilience and stability (Cheng, 2021).

Based on the review of the domestic level win-set from institutional perspectives, the implementation of the Clean Development Mechanism policy in China cannot be considered fully successful. There are gaps between central and local governments due to differences in economic capabilities and resources.

CONCLUSION

The phenomenon of climate change has become a significant impetus for all parties, including China, as the largest greenhouse gas and CO2 emitter, to undertake various initiatives, one of which is reflected in the Clean Development Goals. This commitment is consistently promoted by China through its Net-Zero Goal for 2060. Putnam's two-level game model aids in understanding the relationship between domestic and international spheres, which requires diplomatic proficiency in implementing global climate change policies. At the international level, China has capitalized on the leadership vacuum in the environmental regime following America's withdrawal. This dynamic was subsequently followed by China's reunification with the European Union, thereby strengthening China's position through existing policies.

However, the diplomatic process cannot be viewed solely in the context of international-to-domestic communication capabilities. Of equal importance is how domestic interests and needs can be addressed and fulfilled through the resulting climate change policies (win-set). To achieve a populist and widely recognized status, a policy must be comprehensive across various sectors and levels.

From the above exposition, it can be inferred that the Clean Development Mechanism policy product implemented in China, particularly concerning the China Certified Emission Reduction (CCER) scheme, requires consideration at the domestic level. This is because actual conditions, such as domestic capabilities and interest models, must be accommodated within the agreed policy framework. Furthermore, as Putnam suggests, one key to success at the domestic level is the support of coalitions and state institutions in providing a foundation for policy success, in this case, the Clean Development Mechanism.

It is crucial to note that the success of a policy like the Clean Development Mechanism at the domestic level hinges on its ability to address and integrate the varied interests and capabilities of different regions and sectors within China. The policy must be flexible enough to accommodate these differences while still maintaining its overall objectives and international commitments. This balancing act between domestic realities and international obligations is at the core of the two-level game theory and is particularly pertinent in the context of China's climate change policies.

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