Three decades of Global Carbon Markets in Indonesia: Fragmentation, Conflicts, or Cooperation?

MSc Thesis Research – ENP 80436

Rifqi Hakim Dewanto

1248057

Supervisor: dr. M (Mattijs) Smits

Table of Contents

Acknowledgement

This thesis is a product of my curiosity in observing the dynamic of the birth of Indonesia's new carbon market in 2021. Though showing leadership as one of the first countries in Southeast Asia that developed a national carbon market framework, its implementation is filled with debate and conflicts. Trying to understand the root of this dynamic, I traced the history of carbon market in Indonesia, from its start in the Kyoto Protocol era. Though imperfect, working on this thesis enables me to undergo a formative journey: it makes me interview and talk to a lot of inspiring and enthusiastic people in the climate change field, read books I never thought I would read, and force me to think critically about the carbon market, a tool that we have taken for granted as one of the solutions to climate change.

I would like to express my gratitude to people that guide and accompany me during this journey. Firstly, I thank Dr. Mattijs Smits for being a superb supervisor. His inputs and guidance help me in improving this thesis, challenging me to think more critically, while also giving me freedom in shaping this thesis. Secondly, I thank my interviewees that provide me with valuable inputs and knowledge that help to flesh this thesis. Each discussion, talk, and interview is particularly important to me—it helps to not only answer my questions for this thesis, but also leaves me with enriched insights about environmental and climate issues in Indonesia. Thirdly, I thank my family and friends for their constant help throughout not only the writing of this thesis, but also my whole study. The warmth, care, and support that my family and friends provide to me is one of the big reasons that I can finish this thesis on time. For that, I am eternally grateful.

Finally, I also thank LPDP for the funding that made my study in Wageningen University and Research possible. This thesis is devoted for the development of Indonesia, made possible by the fundings from Indonesian people. Although a small contribution to the great challenge that Indonesia faces, I hope this thesis serves as a small proof of commitment that its people are working towards the betterment of the country.

Having said that, I hope the readers find an enjoyable time in reading this thesis. Happy reading!

Abstract

Global carbon market in the post-Paris Agreement era showed significant signs of fragmentation with more countries setting up its own carbon market framework and the further disconnect with the voluntary mechanism. This fragmentation pose questions on how should carbon markets link and interact with each other. Regardless, carbon market design is a political choice, and depends on the interest on actors behind it. This research turns to Indonesia to see this nuanced development and interaction of various carbon market mechanisms under the global carbon market. Through institutional and governance architecture theory, this research unpacks global carbon markets and understand the embedding process within Indonesia as well as interaction between different carbon market institutions in Indonesia. Building on findings from literature reviews, interviews with stakeholders in Indonesia's carbon market, this research traces the embedding process of global carbon market in Indonesia since the ratification of the Kyoto Protocol in the 1997 to its newest release of carbon market framework in 2021. This research shows how Indonesia "pruned" the global carbon market, highlighting only the "carrot" part of the carbon market, and neglecting the "stick" part of it. This research highlights two milestones in international climate governance—REDD and NDCs—that have shaped Indonesia's carbon market. REDD reinforced carbon markets as investment tools in Indonesia, deepening reliance on international frameworks, while NDCs enabled Indonesia to establish its own carbon market institution, enhancing national control for achieving climate targets. Post-NDC, Indonesia's new carbon market faces challenges, primarily in the forms of conflict with VCM. Stemming from the reliance on international systems, a limited domestic capacity inhibits development of a robust local market. As the Paris Agreement's Article 6 promotes centralized carbon markets, global cooperation is essential to design global carbon markets that answers to the unique needs of developing nations.

List of Abbreviation

CER : Certified Emissions Reduction

CDM : Clean Development Mechanism

MEMR : Ministry of Energy and Mineral Resources

MoEF : Ministry of Environment and Forestry

MRV : Monitoring, Reporting, and Verification

NDC : Nationally Determined Contribution

REDD+ : Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

SPE-GRK : *Satuan Pengurangan Emisi-Gas Rumah Kaca/*Greenhouse gases emission reduction unit

SRN-PPI : *Sistem Registri Nasional-Pengendalian Perubahan Iklim/*National Registry System on Controlling Climate Change

UNFCCC : United Nations Framework Convention on Climate Change

VCM : Voluntary Carbon Market

Chapter 1 Introduction

Carbon markets as market-based mechanisms in climate governance have been growing and evolving for more than 30 years. Drawing from the experiences of emission trading in the US, UNFCCC launched market-based mechanism first time during the implementation of Kyoto Protocol in 1997 (Newell and Paterson, 2010). The Kyoto Protocol enabled countries to trade emission between Annex I countries (International Emission Trading/IET), or offset their emission through projects implemented in another countries (Clean Development Mechanism/Joint Implementation) (UNFCCC, 2005). Since then, carbon market has been implemented worldwide, with the Kyoto Protocol as its largest umbrella with various market mechanisms under the protocol, turning the carbon market into a global carbon market.

The scene of global carbon market in this early era also saw development of various regional carbon markets and other mechanisms with varying linkage to the Kyoto Protocol. In 2004, European Emission Trading System decided to link with Clean Development Mechanism (CDM) (Michaelowa, Shishlov and Brescia, 2019). At the same time, Voluntary Carbon Markets (VCM) also took form, utilizing the momentum created by the Kyoto Protocol and supported by private sector initiatives in demonstrating its environmental leadership and appeal to their consumers (Lang, Blum and Leipold, 2019; Michaelowa, Shishlov and Brescia, 2019). In VCM, companies can voluntarily write off their emission to claim carbon neutrality targets using offsetting mechanism by purchasing “credits” generated by carbon offset project (Corbera, Estrada and Brown, 2009).

Post Paris Agreement, the global carbon market fragments further. As Paris Agreement promote a more universalized ambition, all countries are required to submit a Nationally Determined Contribution (NDC) and encouraged development of carbon market framework in each country. By 2024, there are thirty-six systems of emission trading system (ETS) with additional twenty-two systems are in various stages of development. In the Asia-Pacific region only, India has started to develop their own carbon market framework; Vietnam, Malaysia, Pakistan, Philippines, Thailand, and Türkiye are developing ETS; while Indonesia has started piloting their own ETS since end of 2023 (ICAP, 2024). Not only that, the compliance nature of NDC also leaves less space for VCM, as it utilized the uncapped environment of non-annex I countries to build their carbon offset projects and proves additionality of their projects (Ahonen *et al.*, 2022; Battocletti, Enriques and Romano, 2023).

Problem description

A particularly vexing issue within this increasingly diverse markets under the global carbon market is how various carbon markets would link and operate with each other (Newell, Pizer and Raimi, 2013; Ahonen *et al.*, 2022). A robustly linked carbon markets is argued to be preferrable, as it provides a more liquid market as well as increasing environmental integrity by having a wide sectoral and geographical coverage (Ranson and Stavins, 2016; Riehl *et al.*, 2017). Despite that, a fragmented global carbon market also poses a challenge in effectively trading across carbon markets due to possible differences in critical design choices; such as MRV (monitoring, reporting, and verification) method, target and enforcement stringency, among others (Tuerk *et al.*, 2009).

Regardless, carbon market design and linkage is a political choice, and is impacted by the dialectical relationship with the political coalition built around it (Paterson, 2012; Ranson and Stavins, 2016). Moreover, carbon market does not develop in a vacuum, but depend and respond to the interests of governmental, private sector, and civil society actors (Mol, 2012). As such, understanding the challenge of a fragmented global carbon market requires us to look beyond the regulatory complicacy of operationalizing the carbon market, but also understand the process of how a carbon market comes about and interact with other carbon markets.

The phenomenon in which the unique socio-political condition of a country conceives and shapes carbon market as a respond of the development in global climate governance is rarely put into spotlight. When there is, a strong emphasis is put on emerging economies such as China (see example: Qi *et al.*, 2008; Lo and Cong, 2017; Zeng, Faure and Feng, 2024). Nevertheless, a diverse analysis on the development of and interaction between carbon markets in the global south is still lacking. Hence, it leaves a gap in a more holistic understanding of dynamic within the fragmented global carbon market, where global south is now becoming a hotspot of new regional carbon market as mentioned before.

Indonesia serves as a good case study to see this nuanced development and interaction of various carbon market mechanism under the global carbon market. As a developing country, Indonesia was in the top ten number countries by the numbers of CDM projects hosted (Larson, Dinar and Frisbie, 2011). VCM activity is also pronounced in Indonesia—by 2022, there are 6 certified REDD+ projects amounting to more than 65 million of verified carbon units retired from Indonesia (Nofyanza and Dwisatrio, 2023). Most importantly, Indonesian government has recently established its own carbon market framework, creating its own offsetting standard and system, as well as started an emission trading system for domestic power generation companies (Government of Indonesia, 2021; KESDM, 2022). Regardless, this new development is still plagued with challenges in the operationalization of carbon market in Indonesia, with the restriction of VCM activities and international trading at the centre of it.

Research Aims

Based on this background, this research aims to make several contributions. First, the research aims to contribute to understanding on how carbon market is conceived within a country, shaped and limited by its socio-political context as well as its diverse sets of actors and agendas. Second, the research also aims to understand the political choice of the design and stability of carbon market. Finally, by focusing on Indonesia, this research also aims to enrich the insight of how carbon market is institutionalized and operationalized in the global south, as well as shed some lights in the implication of the future of fragmented global carbon market under the Paris Agreement regime.

Hence, this research traced the development of global carbon market in Indonesia. This research aims to understand how global carbon market was conceived and evolving in Indonesia—what regulations it triggered, what were the drivers, and who were the actors behind it. With the context of global climate governance, this research aims to illustrate how Indonesia adopts, converses, and shapes carbon market within the country. In mapping this evolution, this research also aims to shed light on how the local context shapes the interactions and linkages between different carbon market institutions in Indonesia, primarily through the CDM, VCM, and its newly implemented carbon market framework.

Research Questions

The main research question of this thesis is: "How do global carbon market developments become embedded and adapted in Indonesia’s climate governance?”

Specifically, the research question is as follows:

1. How have global carbon markets been embedded and regulated under different carbon market institutions in Indonesia?
2. How have the key actors involved in Indonesia's carbon market changed over time?
3. How have the norms and principles underlying the implementation of carbon market evolved in Indonesia?

Structure of the Report

This report is structured with nine chapters. Chapter 1 presents the background of the study, research aims, and the research questions. Chapter 2 provides an explanation of seeing carbon market as an institution as well as the governance architecture framework to assess the interaction between institutions. Subsequently, Chapter 3 describes the design and methodology utilized for this research. Chapter 4, 5, 6, and 7 present the findings of the study, chronologically recounting the development of carbon market in Indonesia and internationally as a context. The finding chapters are structured from the start of Kyoto Protocol until the establishment of Indonesia’s new carbon market framework. Chapter 8 discusses these findings—illustrating the institutionalization process of carbon market in Indonesia, drawing experiences from other global south countries, and reflecting on the fragmentation of global carbon market and its implication. Finally, Chapter 9 provides a conclusion to the research and policy recommendation as well as future research agendas.

Chapter 2 Conceptual Framework

This research utilized institutional theory and governance architecture theory to unpack global carbon markets and understand the embedding process within a country as well as interaction between different carbon market institutions. Carbon markets can be conceptualised as an institution that serves a certain jurisdiction and purpose. Institution is a human invention that structures political, economic, and social interaction (North, 1991). As such, carbon market's role in shaping economic, social, and political interaction allows us to see it as an institution. At the same time, seeing carbon market as an institution enables us to assess the embedding process—i.e., how it is shaped by social relations that the institutions are embedded in (Granovetter, 1985)—and how it interacts with other carbon market institutions. Seen from this perspective, we can shed light on how carbon market design and linkages as a political choice (Ranson and Stavins, 2016), and understand the interaction between carbon market institutions through governance architecture (Biermann *et al.* 2009). The following section discusses relevant key concepts of institutional and governance architecture theory to be further operationalized in the research.

Carbon Market as an Institution

Borrowing application of institutional theory from Knox-Hayes (2010), carbon market can be seen as a capitalistic institution with three pillars: regulative, normative, and cultural-cognitive. These pillars give institution stability, perpetuated by actors as carriers of the pillars (Knox-Hayes, 2010). Consequently, how carbon market operates, relates strongly on the three pillars that are embedded within actors in the carbon market institution. Figure 1 illustrated these pillars and interactions.

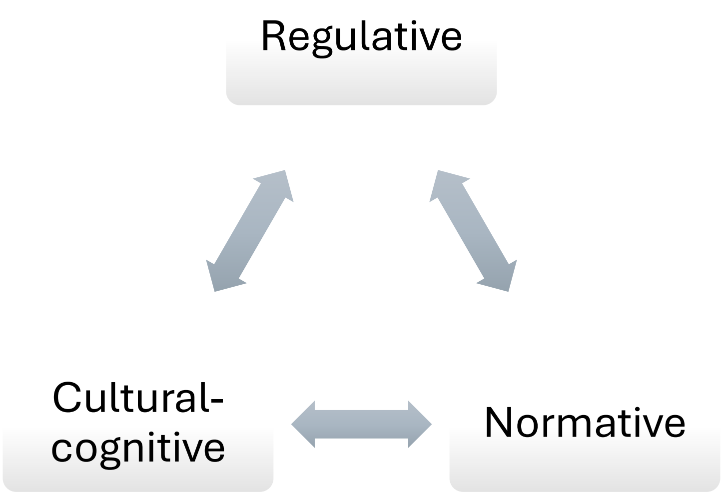

Figure 1 Three pillars of Carbon Market Institution, based on Knox-Hayes (2010)

Knox-Hayes (2010) applied institutional and structuration theory to understand how different actors (in forms of firms and organization) carry and contest each other under the three pillars of institution that makes up carbon market institution. The author argued that understanding carbon market simply as a regulatory mechanism is limited—in other words, simply evaluating their emission reduction capacity to understand the performance of a carbon market is not enough. Carbon market can be considered as an artificial institution designed to organize collective behaviour. This institution shapes how actors behave, through establishing regulations including reward, sanction, and monitoring; prescribing common values; and constructing relationship between actors to define social reality with shared conceptions. Not only that, but these pillars are also interacting with each other: norms prescribe regulation and affect how actors are relating to each other and vice versa. The following sections describe each pillar of carbon market institution.

Regulative pillar of carbon market institution

This part is the most tangible part of the carbon market pillars. Knox-Hayes (2010) argued that in carbon market, the most important regulatory component is the acknowledgement of carbon as a trading property. By establishing the legality of carbon to be traded, the market institution can start their operation, because they have something that can be bought and/ or traded. This in turn create demand and supply, both carbon as a traded property but also carbon reduction.

However, the importance of other regulative elements of carbon market should not be diminished. Tuerk et al., (2009) noted two broad categorizations of policy barriers of carbon market linkages, in which they all fall under the regulative pillars of carbon market institutions. These two barriers are categorized as easy to overcome (superficial carbon market design including MRV method, registries, compliance period and allocation method) to a more difficult one (the fundamentals and principles of designs of the carbon market, including target and enforcement stringency, credits eligibility, and cost-containment measures).

In this research, the regulatory pillar of carbon market is defined as both the acknowledgement of trading property as well as various regulatory products that regulates how carbon market is implemented, whether globally and domestically in Indonesia. Therefore, this regulatory pillar can take form as wide as the articles in the Kyoto Protocol and Paris Agreement, to national legislations and law regarding carbon market.

Normative pillar

This pillar is the less tangible part of the carbon market institution. Knox-Hayes (2010) defined it as a “social force that support the existence of the institution, as well as creating a normalized social belief in the purpose of the institution”. More specifically, Knox-Hayes (2010) defined the normative pillar of carbon market institution as the social value of reducing greenhouse gas emissions and the society’s trust that the institution is able to provide social goods by addressing climate change, in terms of driving decarbonizing innovations. These two ideas lay as a normative foundation in which carbon market institution is built upon; without both ideas, carbon market will cease to exist.

In this research, the normative pillar of carbon market is viewed broader than the social value of decarbonization. This research viewed norms as both ideas and values that drive the implementation of carbon market by the actors. As Paterson (2012) put it, the operationalization of carbon market lies in the need to create of cycles of growth for the economy to sustain climate policy, and the pursuit of environmental integrity. These two broad ideas and values also dictate how the carbon market is designed and operated: e.g., the stringency of the targets, the prioritized sectors, the process of MRV, the acknowledgement of offsets programs, and so on. All discussions, considerations, and deliberation in operating carbon market ultimately come back to these two arguments, and therefore these two ideas provide a rich discourse in which the logic behind different design of carbon market institutions can be understood.

Cultural-cognitive pillar

Finally, the third pillar of carbon market institution is the underlying cultural-cognitive aspect. Knox-Hayes (2010) defined it as relational systems and conceptions of control. In the relational system, carbon market institution establishes new forms of relationship between actors that operate the market, such as client-service provider, within various chain of services that are necessary to support the activity of carbon market. In this relational system, the actors share (or rather, contest and the debate) the same conception on what the carbon market should look like and establish expectation on how the other actor should behave within the carbon market institution. This can be in forms from timing of trading, expected volume, and margins of return in a partnership, for examples. This relational system determines how carbon market is operationalized (and vice versa), and therefore is not static. As Chartier & Tsayem Demaze (2022) insinuated, the changes in global climate governance led to hybridization and reconfigurations of roles of actors in voluntary carbon offsetting. Therefore, examining carbon market institutions on different time frame will lead to a unique relationship of actors.

On top of these relational networks, the second element of cultural-cognitive pillar is the conception of control, which Knox-Hayes (2010) defined as the power structure between actors. This conception of control can be in the forms of jurisdiction to form region-based conceptions of control. This can be seen in the development of various national carbon pricing initiative currently. As such, the powers reflected in the carbon market institution is reflected through how “wide” the area of jurisdiction that said carbon market governs.

As mentioned, these pillars constituted to what we call as a carbon market institution. However, actors in global carbon markets are not only firms and organization, but also government in nation-states. For example, the perception that government is a central figure in law and policy making can stifle the growth of private-led regulatory framework (Ahonen *et al.*, 2022) and reinforce the position of government as a powerful actor in the cultural cognitive aspect. Moreover, this framework is not adequate in explaining the interactions between carbon market institutions, reflected by different pillars adopted by different actors. Therefore, an additional framework is used to analyse the interaction between the emerging and incumbent institution, which is governance architecture by Biermann et al., (2009).

(Climate) Governance architecture

Biermann et al., (2009) defined governance architecture as clusters of norms, principles, regimes, and other institutions that govern a certain issue area. Through governance architecture, analysis of interaction between different regimes and other types of institutions across an issue area can be assessed. This framework is useful in investigating a policy domain that are filled with patchworks of (international) institutions that are different in characters, constituencies, as well as spatial scope, something that the author called as *fragmented* global governance. This rings true not only when seeing climate change as a policy domain, which are increasingly governed by intricate network of treaties and cooperations, but even more specifically when seeing carbon market as part of the larger climate governance architecture, as shown by the development of various regional carbon market institutions.

Applying this concept in global carbon market institution allows us to inspect global carbon market as a larger institution comprised of multiple smaller institutions and actors in varying levels and forms, from private to public, and intergovernmental to singular state. Seen from this perspective, carbon market is not a monolithic institution, and even different jurisdiction and purpose can lead to a distinct institution. Each institution also affects each other, in terms how they are operating and developed. Chen & Xie (2023) utilized this approach to unpack the typology of regime (institution) interactions between compliance and voluntary carbon market. Departing from this reasoning, the degree to which institutions within global carbon market institution is fragmented can be analysed.

Biermann *et al.*, (2009) defined fragmentation in governance architecture as the degree to which governance is dispersed across multiple institutions, organizations, and rules, often with varying levels of coherence, coordination, and inclusiveness. Three degree of fragmentation is defined by Biermann *et al.*, (2009) in a spectrum-like manner: synergistic, cooperative, and conflicting—depending on how institutions, norms, and actors within the governance architecture are connected with each other. Table 1 summarized the three typologies of fragmentation that the author suggested.

Table 1 Typology of Fragmentation of Governance Architectures. Adapted from Biermann et al., (2009)

	Synergistic	*Cooperative*	*Conflictive*
Institutional Integration	One core institution, with other institution being closely integrated	Core institutions with other institutions that are loosely integrated	Different, largely unrelated institutions
Norm conflicts	Core norms of institutions are integrated	Core norms are not conflicting	Core norms conflict
Actor constellations	All relevant actors support the same institutions	Some actors remain outside main institutions, but maintain cooperation	Major actors support different institutions

Operationalizing the frameworks

In this research, the governance architecture framework serves as a larger backdrop and demarcation in which the three pillars of various carbon market institutions both in the global and domestic sense can be assessed in terms of their interaction. To know whether regulations, norms, and cultural aspects between carbon market institutions are interacting and create fragmentation, they need to be geared towards the same objective, which is climate governance. Figure 2 illustrated the proposed theoretical framework of this research.

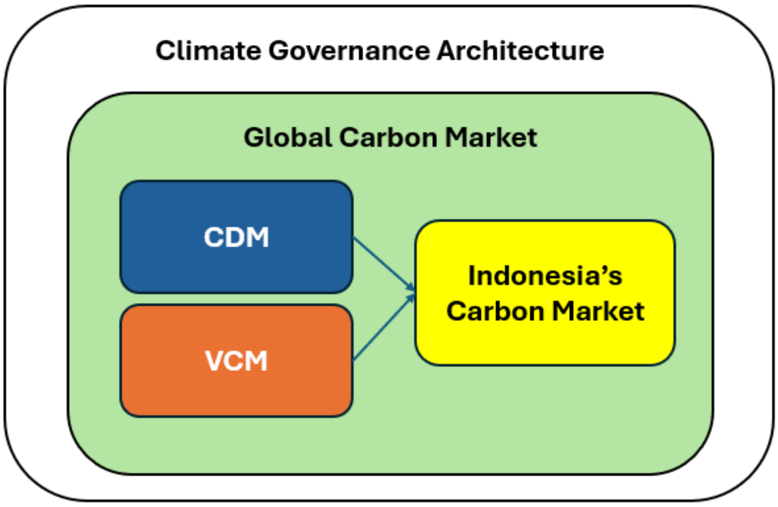

Figure 2 Theoretical Framework

This research acknowledged the complementarity between Knox-Hayes' (2010) definition of carbon market institution and what Biermann *et al.* (2009) defined as governance architecture. Both theories are concerned on institutions, the norms that support the institutions, and the forms of relationship between actors within the institutions. Through this complementarity, this research utilized these theories to deconstruct various carbon market institutions to its pillars, show the pillars were supported by different actors, and assess their fragmentation and interaction with each other.

CDM, VCM and Indonesia's carbon market were utilized as a unit to see the embedding process and interactions of global carbon market in Indonesia. Focusing on these institutions, each of this carbon market institution can be broken down into the three pillars of carbon market institutions in both international and domestic setting. In this sense, carbon market can be seen as the regulation that made it possible, the norms or the drivers, and the cultural-cognitive roles that are prescribed by the institution. Then, the interaction between each institution can be seen through governance architecture lens, determining their degree of fragmentation. To capture the evolutionary sense, this research illustrated the development of Indonesia's carbon market institution since the Kyoto Protocol era up until its establishment of new carbon market framework.

Chapter 3 Research Design and Methodology

The research was done in four broad steps in a qualitative manner. Firstly, the research identified relevant institutions in which global carbon market in Indonesia is concerned. Particular to this research, three carbon market institutions are the focus of study, namely CDM, VCM, and Indonesian carbon market institution.

Secondly, the research material was compiled. Policy documents, project report, carbon standards, scientific literatures, as well as other related documents such as news articles and grey literature were used as an input to illustrate the evolution of the three pillars of carbon market institutions in Indonesia. The findings were also triangulated with key-informant interviews from relevant stakeholders.

Thirdly, the research looked at the nodes of interaction between the two carbon market institutions, both temporally (i.e., when the interaction and fragmentation take place), as well as substantively (i.e., the mechanisms, and the reasoning behind such phenomenon).

Finally, the research assessed implication of past and emerging interaction nodes for the climate governance architecture of Indonesia as a whole. Figure 3 illustrated the overall methodological framework of this research.

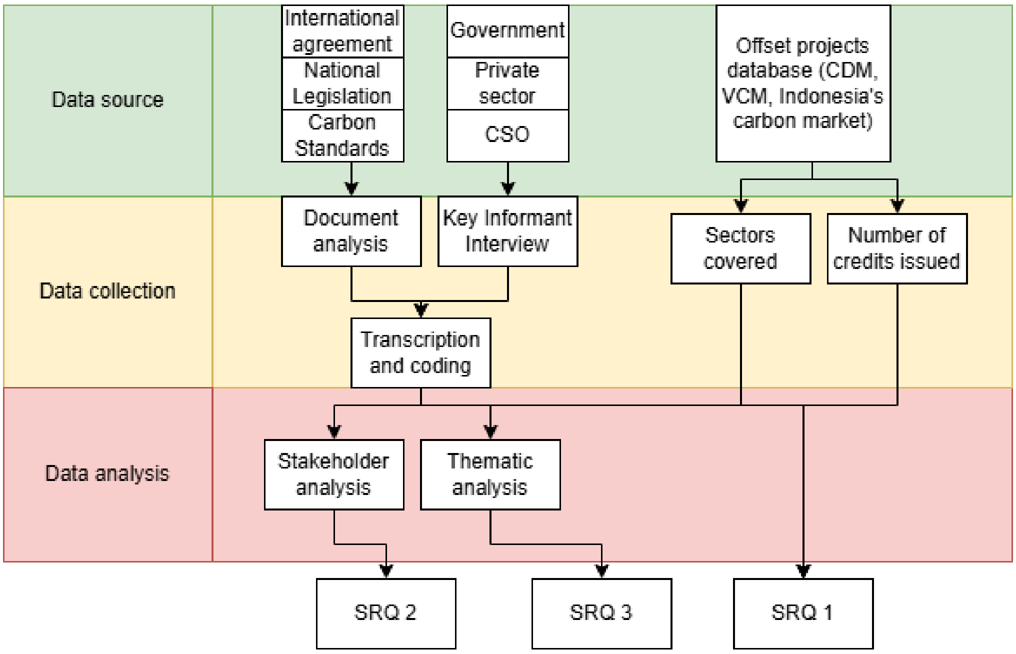

Figure 3 Methodological Framework

The information was obtained from literature review and interview and was analysed qualitatively through thematic analysis. The content analysis included but not limited to the regulation that defines both international and domestic carbon market in Indonesia. Additionally, stakeholder analysis will be done to identify the changing roles between actors on different periods of carbon market mechanisms. The participant targeted in this research were focused to be the actors that are involved in the operationalization of carbon market: in the category of government, private sectors, and civil society organizations.

Data Collection

Content Analysis

This research reviewed relevant documents as its main input. On international settings, document analysis covered analysing international agreements particularly the Kyoto Protocol and Paris Agreement, with significant focus on the market-mechanism part (Article 12 of Kyoto Protocol, Article 6 of Paris agreement). On domestic setting, content analysis included national legislations, ranging from national constitution, presidential and ministerial regulations, as well as circulation letter from the ministries and news article. This research also looked at the progress of carbon offset projects that have happened in Indonesia, particularly the number of credits generated, the sectors of the project, as well as the ownership of the project. The data was sourced from Forest Trends (Ecosystem Marketplace), CDM project database, Indonesia's climate mitigation registry website (SRN-PPI), and other relevant sources necessary. Table 2 provides a list of documents reviewed for this research.

Table 2 Document Analysed for this research

Jurisdiction/Purpose	Documents reviewed
International setting	Article 12 of Kyoto Protocol Article 6 of Paris agreement
Domestic setting	National constitution - Law 17/2014 Kyoto Protocol Ratification - Law 16/2016 Paris Agreement Ratification Presidential regulations and decisions - PR 46/2008 on National Council of Climate Change - PI 10/2011 on Moratorium on Primary Forest and Peatland Conversion - PR 61/2011 on National Action Plan of GHG Reduction - PR 71/2011 on National GHG Inventory - PR 98/2021 on Implementation of Carbon Pricing to Achieve NDC Target and Control GHG Emissions in relation to National Development Ministerial and other national bodies regulations - MoF Reg 68/2008 on Implementation of REDD Demonstration Activities - MoF Reg P.30/2009 on REDD Procedure

	- MoF Reg P.20/2012 on Forest Carbon Implementation - MoEF Reg 21/2022 on Procedures for the Carbon Pricing Implementation - MARVES Reg 5/2022 on Steering Committee of Carbon Pricing - FSA Reg 14/2023 on Carbon Trading through Carbon Exchange - MEMR Reg 16/2022 on Procedures of Carbon Trading in Power Plant Subsector Circulation letter Supplementing technical documents in ministries

Semi-structured Interviews

Semi-structured interview is an overarching term to a flexible and fluid structure of interview, with a loosely held sequence of questions to be asked to the interviewees (Lewis-Beck, Bryman and Futing Liao, 2004). The structure is provided by an interview guide rather than a list of fixed questions, and is made to be able to be expanded and followed up with different interviewees (Lewis-Beck, Bryman and Futing Liao, 2004). Regarding this research, the semi-structured interview was used to uncover the pillars of the carbon market institution, as well as the relationship of actors or cultural-cognitive pillars. Utilizing this method, the research aimed to discover how the actors perceive carbon market; how it is regulated, what aspects of the regulation is lacking, what potential does it have in solving climate change, as well as how they expect for other actors to behave. To uncover this, the interview guide was developed around the actor's history to carbon market: such as the projects and the partners involved, the carbon credits generated, the regulatory process, as well as their overall perception on carbon market.

The interviews were done both online and offline, depending on the interviewee's availability, and the process was recorded upon interviewee's consent to be later transcribed and coded during data analysis. To ensure the transparency of the research, type of organization, as well as the position of the interviewees are included in the report, omitting personal unique identifier. However, when necessary, further omission were considered. The sampling was done in a snowballing sampling strategy, where the initial key-informants gave references to the next informant to be interviewed, based on the category described previously. Table 3 provides a list of interviewees interviewed for this research.

Table 3 List of Interviewees

Code of Interviewee	Institution/Organization	Category	Position
I1-MEMR1	Ministry of Energy and Mineral Resources (MEMR)	Government	Head of Communication, Public Information, and Cooperation Bureau
I1-MEMR2	Ministry of Energy and Mineral Resources (MEMR)	Government	Sub coordinator for Environmental

			Protection of Electricity Generation
I2-MoEF1	Ministry of Environment and Forestry (MoEF)	Government	Not disclosed
I3-P1	Subsidiary of Indonesia’s State-Owned Electricity Company	State-owned Company	Not disclosed
I4-P2	Carbon project developer	Private Company (Carbon Brokerage)	Managing Consultant, Climate Policy, and Carbon Markets
I5-E1	UK-Pact	Expert/Academia	Climate Finance expert
I6-P3	ESG Consultant	Private Company (ESG and CSR Consultant)	CEO
I7-E2	WRI Indonesia	Think-tank/CSO	Net zero research analyst
I8-E3	International Research Institute	Think-tank	Research Associate
I9-P4	Carbon project developer	Private Company (Carbon project developer)	Project Manager
I10-E4	Carbon project developer	Private Company (Carbon project developer)	Not disclosed
I11-E5	Climateworks	Think-tank/CSO	Senior Analyst
I12-MoEF2	Ministry of Environment and Forestry (MoEF)	Government	Director of GHG Inventory Directorate
I13-MoEF3	Ministry of Environment and Forestry (MoEF)	Government	Not disclosed
I14-IEF1	Indonesia Environment Fund	Government	Director of Fundraising and Development Directorate
I14-IEF2	Indonesia Environment Fund	Government	Head of Fundraising and Service Development Division

Data Analysis

The collected data from the previous step was transcribed with detailed note-taking and coded, to aid in the subsequent analysis. The categorization was developed around the research questions of this research. Primarily, the data from document analysis was categorized and coded both inductively and deductively to discover how the regulative pillars of carbon market changes overtime, both in international settings, and domestically in Indonesia. Having said that, the document analysis also contributed to identify the normative pillars of the carbon market institution. Through assigning what norms and principles that underly the regulation, the normative pillar can be elucidated, and actors’ relationship mapped.

Stakeholder analysis

Stakeholder analysis is a set of tools for generating knowledge about actors – individuals and organizations –in order to understand their behaviour, intentions, interrelations and interests; and for assessing the influence and resources they bring to bear on decision-making or implementation processes (Varvasovszky, 2000). In this research, stakeholder analysis was important to uncover the actor constellation as well as the cultural-cognitive pillar that embedded within it. As explained in the theoretical framework, the cultural-cognitive pillar is comprised of the relational networks as well as the conception of controls within those networks. By utilizing stakeholder analysis, this research mapped out how the different actors interact and influence each other in the operationalization of offsetting mechanism in both carbon market institutions, internationally and domestically.

Thematic Analysis

Thematic analysis is a widely used method in content analysis. It involves creating a coding scheme based on categories that capture the main themes in a text. The coding scheme comprises all the coding categories applied to a collection of texts, with each "coding category" representing a specific characteristic of interest to the researcher (Lewis-Beck et al., 2004).

In this research, thematic analysis was used to explore how the carbon market is framed within different actors in various carbon market institutions. This method was aimed to identify commonalities and differences in the use of carbon market between various actors within different carbon market institutions. It also traced the debated surrounding the use of offsetting mechanisms in both international and domestic carbon markets. By employing thematic analysis, the research elucidated the shift between voluntary and compliance-based usage of carbon market in Indonesia. Furthermore, this method also helped to understand how international linkages influence the utilization of Indonesia's domestic carbon market. In the following chapters, I elaborate the utilization of the theoretical frameworks and methodology in the finding chapters of this report.

Chapter 4— Phase 1: Start of Climate Governance and Initiation of Carbon Market in Indonesia (1997-2007)

This chapter explains how the global carbon market was concepted internationally through Kyoto Protocol, and how it was manifesting itself in Indonesia. As global carbon market was created through the establishment of the CDM in the Kyoto Protocol, it established the first set of regulative, normative, and cultural-cognitive pillars supporting the carbon market as an institution, and gave rise to voluntary carbon market, in which they were somehow linked. As an international creation, the global carbon market also took its roots in Indonesia, along with the establishment of its initial climate regulations and governance. This chapter also seeks to shed lights on how Indonesia, a non-annex I country, responded to this initial conception of carbon market, starting with the ratification of the Kyoto Protocol. Figure 4 summarizes key milestones in this era.

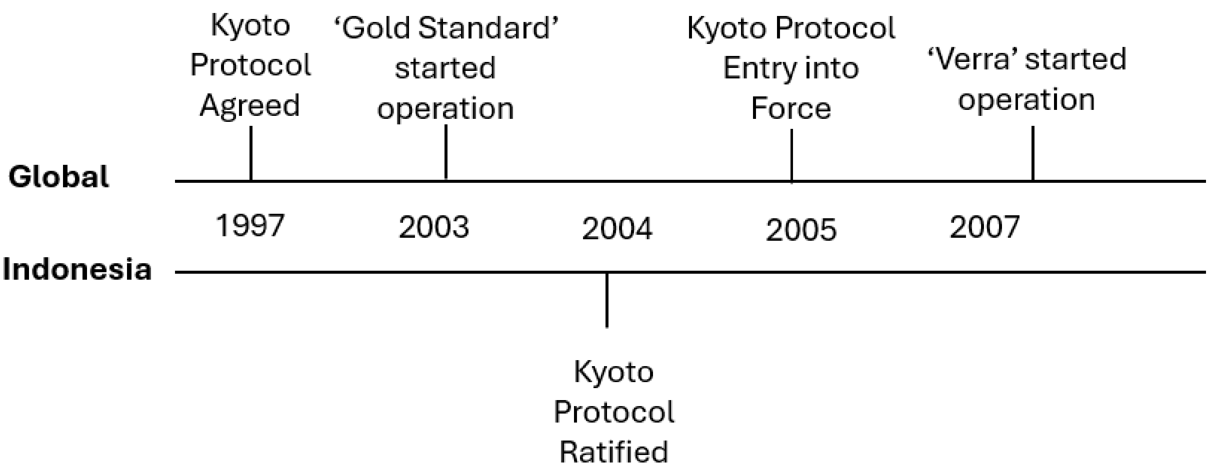

Figure 4 Timeline of Global Carbon Market Development (1997-2007)

World's First Global Carbon Market: CDM

Clean Development Mechanism (CDM) is one out of the three market-mechanism established under the Kyoto Protocol, along with Joint Implementation (JI) and International Emission Trading (IET) (UNFCCC, 2005). This mechanism was conceptualized under the context of bringing the global south (Non-Annex I countries) into climate actions, supporting the global north (Annex I countries) in achieving its emission reduction targets under the Kyoto Protocol. Started as a proposal by Brazil to direct the fines of non-compliance of Annex I countries for adaptation in the South, CDM was framed and agreed as a development tool for the South in the Kyoto conference in 1997 (Newell and Paterson, 2010). The agreed mechanism for CDM is to allow Annex I countries to invest of mitigation projects in Non-Annex I countries, and take credits for the emission reduction generated (UNFCCC, 2005). Compared to the limited number of countries in JI and IET that are only eligible for Annex I, CDM became the world's first and leading institution in the global carbon market. In the following sections, I unpack the pillars that support CDM as an institution.

Norms that support the existence of CDM

As a carbon market institution, CDM was supported first and foremost by—as Knox-Hayes (2010) put it— the recognition of the social value of reducing emissions and the ability to provide a social good by addressing climate change is the core of normative pillar of carbon market. This recognition was cultivated and institutionalized among states since the 1972 UN Conference on the Human Environment in Stockholm and the 1992 UN Conference on the Environment and Development (UNCED) in Rio de Janeiro (Bernstein, 2001). However, this is not the sole normative pillar of CDM. Its unique mechanism and history in international environment governance provided us to draw more norms that were embedded in this institution. Along with this social importance of decarbonization, there are also two interrelated norms that supported the normative pillars of CDM, which are sustainable development (SD) and common but differentiated responsibility (CBDR).

SD and CBDR as a norm both gained its international recognition in the 1972 UN Conference on the Human Environment in Stockholm. SD was then agreed as a notion that (economic) development and the environmental crises can be addressed in a mutually beneficial way (Mensah, 2019). CBDR, on the other hand, stemmed from the recognition that developing countries have different capacity on addressing environmental issues, leading to different responsibility (Stone, 2004; Honkonen, 2009). In what Bernstein (2001) called as liberal environmentalism, convergence of environmental and liberal economic form brought along the concept of SD and CBDR, and the increasing preference of market-mechanism in environmental (including climate) governance. As Article 12 of the Kyoto Protocol stated:

The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3. (Art. 12, Point 2) (UNFCCC, 2005)

Through the Kyoto Protocol, SD and CBDR became part and parcel of the international climate governance, and in consequence, CDM. The very distinction of responsibility between Annex I and Non-Annex I countries in the Kyoto Protocol is its most obvious reflection. Annex I countries were required to set a legally binding emission reduction as outlined in the Annex B of the Kyoto Protocol, whereas Non-Annex I countries are encouraged to focus on sustainable development and voluntary climate action with the support of Annex I countries (UNFCCC, 2005). CDM, which was a mechanism that enabled Non-Annex I countries to pursue sustainable development with the support of Annex I countries, also reflect these two norms.

Finally, CDM was also supported by the economic rationality of market mechanism. Its existence was driven by the question of Annex I countries to utilize the untapped potential of Non-Annex I countries, with abundant "low-hanging fruit" for cheap mitigation activities (Newell and Paterson, 2010). CDM is then seen as a flexible and efficient way to address climate change, centred around market-mechanism. As Gregorio (2021) stated, the incentive of taking credits of emission reduction becomes an underlying motivation for the global north to push for mitigation measures in the global south. With the context of achieving SD in Non-Annex I countries and fulfilling the responsibility of Annex I countries as prescribed by CBDR, CDM became part of the global carbon market institution where these norms can sit comfortably in an economically win-win situation.

With this idea, CDM is established, and structured with regulations around it, as the following section discusses.

CERs as the regulatory pillar of CDM

The regulative pillar of CDM is carried by the establishment and issuance process of its traded commodity, Certified Emissions Reductions units (CERs). In order to establish and issue CERs, CDM projects have to go through a project cycle, encompassing various stages of projects, from design, validation, monitoring, verification, and issuance, as figure 5 illustrated.

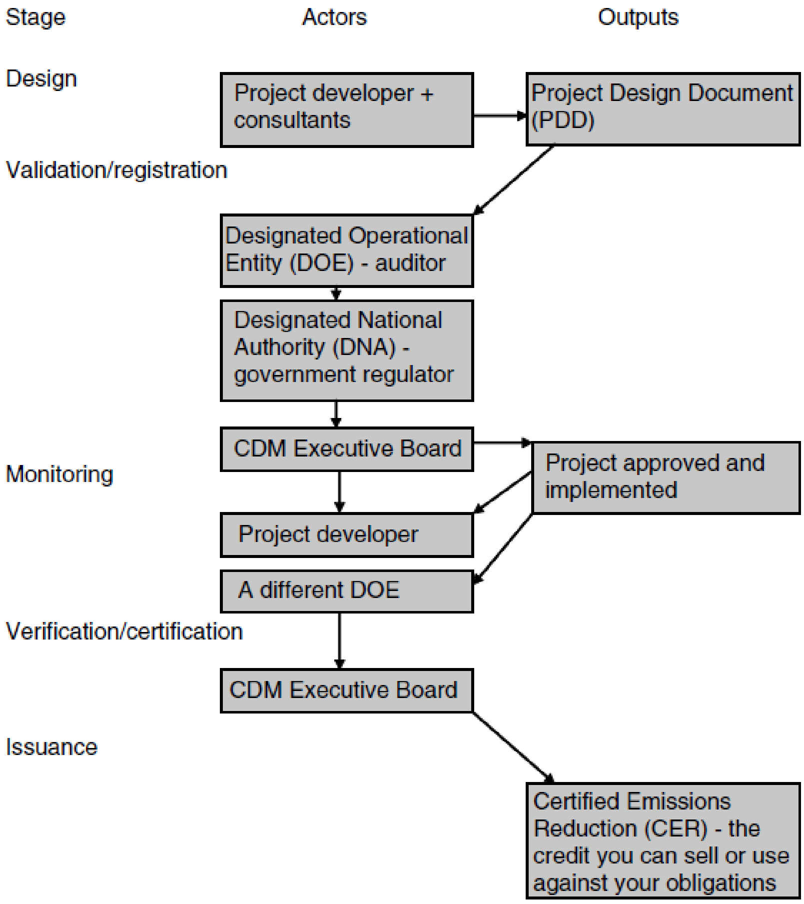

Figure 5Project Cycle of CDM (Newell and Paterson, 2010)

CDM is what we now know popularly termed as a "baseline-and-offset" carbon market mechanisms. In this mechanism, carbon credits (in CDM case, CERs), is generated through a carbon project by establishing a "baseline" emission, basically a projection of emission should the project do not occur (Newell and Paterson, 2010). The difference between baseline emission and emission reduction generated by the project is what then becomes credited, to be used to "offset" the emission of another entity, which in CDM's case, the Annex I countries.

Central to "baseline-and-offset" mechanism is the concept of "additionality", which boils down to proving that without the projects enabled by the carbon market, emission reduction will not happen (Battocletti, Enriques and Romano, 2023). The importance of proving additionality stemmed from the need to prove that emission reduction happened in CDM is a "real" emission reduction (Newell and Paterson, 2010), which can be traced back to the first normative pillar:

social value of decarbonization. To prove this, various methodologies are employed, from setting up the baseline emission and counting emissions reduction from the project, which can be from various sectors (energy, waste, and forestry, among others) and scales (large and small) (*CDM: Methodologies*, 2024). Proving this is a complex process, which require coordination of various actors, from project developers, auditor (Designated Operational Entity, DOE), governmental entities, and most importantly, the CDM Executive Board.

Actors and Relations within the CDM

The establishment of CDM as a carbon market institution cemented a certain relational systems and conceptions of control. First, with the importance of proving "additionality" in CDM projects, the project cycle of CDM assigned roles to actors, as previously outlined. Central to this process is the role of CDM Executive Board, which was established under the Kyoto Protocol to oversee the mechanism's operation and ensure compliance with its rules. The CDM EB is responsible for accrediting Designated Operational Entities (DOEs), approving methodologies, registering projects, and supervising the issuance of Certified Emission Reductions (CERs) based on verified emissions reductions (UNFCCC, no date). As such, CDM EB becomes the *bona fide* of CDM, ensuring its transparency and integrity (Newell and Paterson, 2010).

Second, and most importantly, CDM also established a donor-recipient relationship between Annex-I and Non-Annex I countries. As a mechanism based on the CBDR principle, Annex-I countries assumed the role of donor in ensuring the Non-Annex I countries have its support in achieving sustainable development, and, to a lesser extent, emission reduction. The claimable emission reduction from CDM for Annex I countries were given as an incentive to Annex I countries to help Non-Annex I countries in developing its capacity in climate mitigations. Through this, it has transformed the relationship of North-South dynamic in climate negotiations (Newell and Paterson, 2010).

The division and cooperation between compliance and voluntary carbon market

The global carbon market institution was fragmented from the beginning. The legally binding (compliance) emission reductions targets of Kyoto Protocol created a space for growth for voluntary carbon market (VCM). Compliance carbon market was driven by the emission reduction target that Annex I countries had. On the other side, voluntary carbon market was driven by the pressure from public to increase the environmental profile and leadership of corporation (Corbera, Estrada and Brown, 2009). While this differentiation existed, the compliance and voluntary carbon market was inextricably linked to each other.

The development of VCM cannot be separated by its compliance counterparts. Although private initiative and experimentation in emission offsetting and trading predates the establishment of the Kyoto Protocol, its proliferation triggered afterwards (Calel, 2013). As the CDM gained popularity and became an established compliance market in the mid to late 2000s, an increasing number of companies and governments began participating in parallel voluntary mechanisms globally (Benessaiah, 2012). It also invited a wider set of participants in the global carbon market compared to CDM. Aside from project developers and consultant that existed in the CDM, VCM also introduced aggregators, retailers, brokers, and final customers in forms of entities or corporations to the mix (Riedy and Atherton, 2008). Nevertheless, VCM and CDM both shared the same economic rationality of providing a cost-efficient decarbonization in forms of carbon credits generation.

On top of this, VCM also filled the gap that CDM left within the forestry sectors. In 2006, less than 1% of CDM credits were sourced via approved forestry methodologies, compared to 37% of forestry carbon credits in the voluntary carbon market (Ecosystem Market Place and New Carbon Finance, 2007). VCM boasted its ability by having a lower financing and bureaucratic hurdles in forestry projects compared to CDM, along with having a more "charismatic" quality in claiming high sustainable development co-benefits (Ecosystem Market Place and New Carbon Finance, 2007).

Even then, there was a growing concern that VCM was lacking in legitimacy due to non-existent control from a centralized body such as CDM EB (Riedy and Atherton, 2008). This further drove the interaction between voluntary and compliance carbon market. In 2003, the World Wildlife Fund (WWF) partnered with other international non-governmental organizations (INGOs) to develop a voluntary carbon offset program and registry called the Gold Standard, which was used to complement CDM with a standard called CDM GS. By 2007, businesses and environmental leaders formed the Verified Carbon Standard, or Verra, that closely resembles CDM processes (Riedy and Atherton, 2008).

Indonesia's beginning of climate governance and carbon market

In the beginning, the priority of implementation of the carbon market as a climate governance instrument in Indonesia was not to decarbonize the nation's emission. Rather, it was designed to capture incentive from the international community with the momentum of the global increase of attention to climate change. It took 7 years after the agreement of the Kyoto Protocol in 1997 to the ratification of the Kyoto Protocol in Indonesia in 2004, as Indonesia was stabilizing itself under the shadow of Asia's financial crisis in 1997 and Indonesia's new order reformation in 1998, (Barr, 2001). The Kyoto Protocol, with its possibility of attracting foreign investment through CDM, became an attractive opportunity for Indonesian government. As the introduction part of the law stated:

"...As a developing country undergoing growth, Indonesia needs to accelerate the development of low-emission industries and transportation using clean and efficient technology as well as renewable energy. Additionally, Indonesia needs to enhance the capacity of its land and forests to absorb greenhouse gases (GHG). The Kyoto Protocol ensures that technology transferred to developing countries must meet these criteria through the Clean Development Mechanism (CDM), regulated under the Kyoto Protocol." (Government of Indonesia, 2004)

This part reflects how the two norms of global carbon market mentioned in previous section became embedded Indonesian national framework. Particularly, there is a strong emphasis of SD and CBDR in this embedding process of the global carbon market, with the decarbonization norm pushed to the background. Indonesia assumed the role of developing countries in helping its sustainable economic growth, primarily through CDM as the vehicle. Indonesian government also framed that economic development and climate change should and can go hand in hand, through the development of technology and knowledge with the support of CDM. These two ideas become the underlying norms and principles of Indonesia's first conception of climate governance, and, in extension, the instrument behind it including carbon market.

This framing illustrates how carbon market was first constructed in Indonesia. Carbon market was (and arguably, is) seen as an instrument that will help Indonesia's transformation into a more sustainable economic development. The CDM, as Indonesia's first experience in building its carbon market infrastructure and ecosystem, also set Indonesia's role as the "host" countries, which would receive support from the developed countries to help with Indonesia's technological advancement and offset the emission of developed countries in return.

In the period of 1992-2007, the activity of carbon market in Indonesia was insignificant. Aside from the ratification of the Kyoto Protocol, Indonesian government did not yet develop any regulatory mechanism that support the implementation of carbon market, be it from the compliance or voluntary realm. There was no voluntary carbon market projects, and until 2007, Indonesia only registered 12 CDM projects—none of which forestry CDM project— issuing around 10 million CERs in its first commitment period (*CDM: Project Activities*, 2024). In its early days, Indonesia struggled to register CDM projects due to issues and lack of capacity in environmental bookkeeping, despite being very supported by the Indonesian government (I13-MoEF3).

Reflection on the first conception of the Global Carbon Market

Knox-Hayes (2010) argued that the normative pillar of carbon market is embodied in the social value of reducing greenhouse gas emissions and the belief that addressing climate change provides a public good. She further asserted that this moral idea is what drives the innovation of carbon market, and cements carbon market as an institution through the believe that it fulfils some positive social role. While this perspective holds when examining carbon market as a singular institution, a wider perspective in assessing the multiplicity of carbon market institutions under global carbon market accentuate different ideas. As presented earlier, the conception of global carbon market was also supported by other norms, namely the pursuit of sustainable development, the common but differentiated responsibility of developed and developing countries, and the economic rationality of market mechanism.

The CDM also introduced critical elements of the regulatory and cultural-cognitive pillars. Through its establishment, a comprehensive regulatory framework for carbon market projects was developed, encompassing project cycles, carbon accounting methodologies, baseline setting, and Monitoring, Reporting, and Verification (MRV) systems. These components formed the regulatory backbone of the carbon market, providing a structure to its operationalization. In the cultural-cognitive sense, the CDM fostered a donor-recipient dynamic between developed and developing countries, shaping the cultural-cognitive aspect of the institution. Host countries—in this case developing nations such as Indonesia—were required to comply with the intricate regulatory frameworks set by the CDM. This compliance process not only facilitated the institutionalization of carbon markets in these nations but also advanced broader climate change governance structures.

Beyond these two ideas, global carbon market institution also made stronger by the shared idea of economic rationality carried by its actors. CDM was developed to provide a more economically efficient way for Annex I countries to achieve its emission target, while fulfilling its differentiated responsibility. At the same time, VCM rose as an alternative to CDM's intricate administrative process, driven by private sectors initiative in making a step ahead in climate financing. The existence of VCM can be seen as partially driven by profit-generating motivation, supported by the early movers of environmentally conscious private actors. Sharing this same idea of economic rationality, global carbon market gave the ability to connect various kind of actors, from government, industries, to financial institutions.

In the period of 1992-2007, we can see the initial conception of carbon market around the world, including in Indonesia. With that being said, institutions within the global carbon market appear to be functioning in cooperatively fragmented manner, with voluntary carbon market serves somewhat as a sandbox and experimentation instrument to be uptake by its compliance counterpart. VCM and CDM were loosely linked to each other globally, while Indonesia was barely planting the seed for both institutions domestically. Figure 6 illustrates the state of carbon market development in Indonesia.

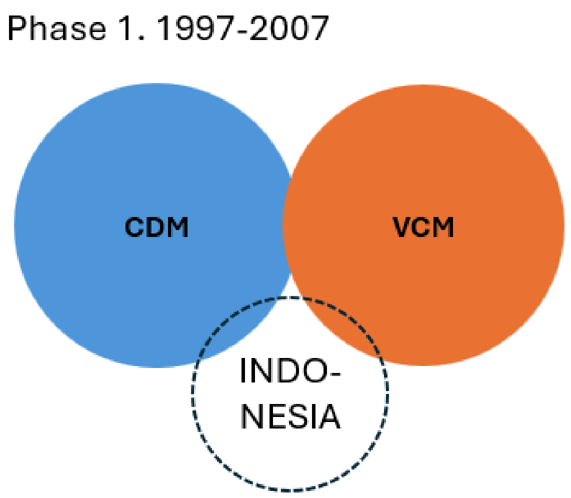

Figure 6 Phase 1 of Carbon Market Development in Indonesia

Nevertheless, the establishment of both CDM and VCM was supported by different norms and resulted in a slightly different constellation of actors. The summary of the pillars established in this phase of carbon market development can be seen on table 4.

Table 4 Summary of the carbon market pillars in Phase 1

PILLARS	INTERNATIONAL (CDM)	DOMESTIC MANIFESTATION	INTERNATIONAL (VCM)
REGULATORY	• Kyoto Protocol	• Ratification of KP	• Private Carbon Standards
NORMATIVE	• Social value of decarbonization • Pursuit of sustainable development • Common but differentiated responsibility • Economic rationality	• Investment opportunity in non-Annex 1 country • Coupling climate governance and economic	• Private-led, extra governmental climate initiative

		development in Indonesia
CULTURAL-COGNITIVE	• CDM Actor constellation (CDM supervisory body, “host country”, “implementing countries”)	• Introduced more actors in carbon market; brokerage, financier

Chapter 5—Phase 2: Increasing ambition in Climate Governance (2008-2015)

This chapter explains how the dynamic of the Kyoto Protocol, as it was entering the end of its first commitment and struggling to go to its second phase of the commitment, affected Indonesia's climate governance and carbon market. A crucial milestone was the 13th COP in Bali in 2007, which gave rise to the establishment of REDD (Reducing Emission from Deforestation and Degradation) as an internationally acknowledged instrument in tackling climate change. Through Bali Action Plan, REDD was institutionalized in international climate governance, and subsequently in Indonesia. At the same time, there was increased pressure for developing countries to increase their own climate ambition. Both factors shaped new and reinforced several existing regulatory, normative, and cultural cognitive pillars of carbon markets in Indonesia. Figure 7 summarized the milestones in Indonesia's carbon market development and global carbon market.

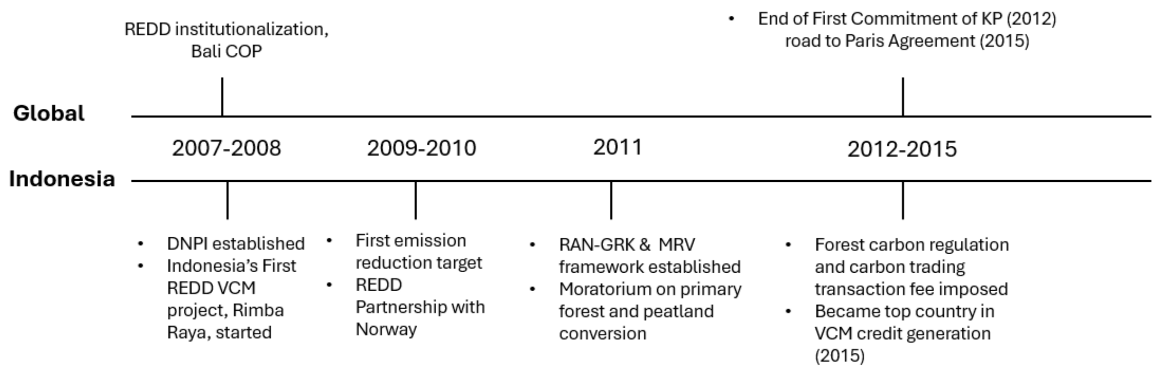

Figure 7 Timeline of Global Carbon Market Development (2008-2015)

Bali COP: Importance of Forest and Developing Countries

As the Kyoto Protocol entering the end of its first commitment phase, there was an ongoing discussion to increase the role of developing countries as well as the role of forest in climate mitigation actions. The role of forest and developing countries in climate change mitigation was a highly contested issue since the conception of UNFCCC. The tension between forest conservation and sovereign right of countries to use their own natural resources became the factors that stalemate the discussion on the fate of forests, especially in developing countries. Even in the early phase of the Kyoto Protocol, forestry CDM projects were limited to afforestation and reforestation, and were few in comparisons to other sector due to its complexity (Bhullar, 2013).

Hence the importance of 13th COP in Bali. In this COP, REDD (and subsequently, REDD+) was conceived as an intergovernmental agreement by which developed countries would provide substantial economic incentives to compensate developing countries for measurable reductions in the conversion of tropical forests to agriculture or other land use (McDermott, 2014). It was hoped that REDD would serve as a win-win solution to the predicament regarding the tension between utilization of forest in the developing countries as well as increasing the capacity of developing countries in pursuing climate mitigation effort (Miles, 2021). Through the adoption of Bali Action Plan, REDD was institutionalized in international climate governance. On top of that, the action plan also encouraged for developing countries to develop their own climate mitigation and adaptation plan, or also known as NAMAs (Nationally Appropriate Mitigation Actions) and the monitoring, reporting, and verification (MRV) framework (UNFCCC, 2008; Sharma and Desgain, 2013).

Through this milestone, we can see how the sustainable development and CBDR principle became modified after being contested by the actors within global carbon market institution. Driven by the pressure to increase the ambition of developing countries in climate mitigation while maintaining the common but differentiated responsibility, REDD serves as a regulatory pillar that bridges in tapping the potential of forest sink through the carbon market. By establishing REDD, the potential of forest in developing countries can be utilized in the carbon market dominated by developed countries, generating incentives to keep the forest as a prove of commitment for both parties. The following section discusses how this opportunity was utilized by Indonesian government to build its climate governance and lay foundation to a carbon market in Indonesia.

Post-Bali: Indonesia's Forest Focused Climate Governance

Bali COP was also a major milestone for Indonesia's climate governance. After hosting the 13th COP, Indonesia experienced a spur of climate governance growth. It started by establishing the National Council on Climate Change by in 2008 (*Dewan National Perubahan Iklim*/DNPI), a semi-independent national body to coordinate the mainstreaming of climate change in sectoral and national development policies (Government of Indonesia, 2008; Gregorio, 2021). In 2009, President Yudhoyono also announced Indonesia's first emission reduction target to reduce greenhouse gas emissions by 26 percent without and 41 percent with international support by 2020 compared to business-as-usual (Gregorio, 2021).

Subsequently, Indonesia also further embedded REDD in its own national institution. Between 2008 and 2009, Indonesia released a series of national regulation regarding implementation of REDD and its demonstration activities in Indonesia (KEMENHUT, 2008, 2009b, 2009a). Further driven by the Letter of Intent with Norway in 2010, Indonesia also established of REDD+ Task Force to further develop the regulatory process reforms aiding REDD implementation in Indonesia (Government of Indonesia, 2011b; Boer, 2018). In relation to this, Indonesia also released a moratorium on primary forest and peatland conversion (Government of Indonesia, 2011a), further advancing the agenda of forest protection in climate governance introduced by the conceptualization of REDD (see more Boer, 2018; Gregorio, 2021; Miles, 2021).

Aside from this, following up the call to establish NAMAs in Bali Action Plan, Indonesia also released its first regulation on National Greenhouse Gases Reduction Action Plan (*Rencana Aksi National Penurunan Gas Rumah Kaca/RAN-GRK)* and implementation of its MRV framework (Government of Indonesia, 2011c, 2011d). Coordinated by the Coordinating Ministry on Economic Affairs and National Development Agency (*Badan Pengembangan dan Perencanaan Nasional*/Bappenas), this national action plan followed a more top-down approach, with the plan consisted of a long-list of various strategic projects to be done by relevant ministries with a certain expected emission reduction. 87% of these emission reduction would be covered through projects in forest and land use sector (Gregorio, 2021). Furthermore, the plan also emphasised the need to embed climate change mitigation and adaptation into national and subnational development plans.

Forest: to credit or not to credit?

The institutionalization of REDD gave rise to a new mechanism in the global carbon market, which is the results-based payment (RBP). For example, fund from Indonesia's partnership with Norway for REDD projects was planned to be disbursed if Indonesia can prove a certain emission reduction in its forestry sector within a certain range of time (Angelsen, 2017). Though promoted as a market-based mechanism, RBP has a significantly different characteristic from other carbon market mechanisms, which is the lack of property rights of tradable commodities in the form of carbon credits. In this section, I explore how REDD had a diverging fate in carbon market institution, drawing from the experience of Indonesia.

Upon its conception in Bali COP 2007, REDD was expected to have compliance carbon market as its long-term funding mechanisms, but it eventually did not happen (Angelsen, 2017; Boer, 2018). REDD projects transformed into somewhat an aid program in the form of RBP due to the failure of integrating REDD+ credits in the global carbon market under the CDM (Angelsen, 2017). In 2014, Indonesia was also struggling to achieve its phase 3 disbursement from the agreement with Norway, disbursing only US$62 million out of the promised cap of US$1 billion due to lack of progress in actual forest emission reduction (McNeill, 2015; Angelsen, 2017). A possible explanation is a lack of alignment on what counts as "forest" in Indonesia, and issues in land tenurial and indigenous rights (Angelsen, 2017).

In contrast, VCM uptake REDD projects with the greatest fervour. As REDD was being developed in international climate governance, with countries setting up its REDD mechanisms, VCM also explored its way of tapping in into this new source of forest carbon credits, getting ahead of the CDM (Ecosystem Market Place and New Carbon Finance, 2015). By 2014, REDD has become the best performing carbon projects in VCM sector, both in volumes of credits generated and the credits price, as shown by the "Avoided deforestation" type in Figure 8 (Ecosystem Market Place and New Carbon Finance, 2015). It was also acknowledged that Bali COP in 2007 became the trigger of this high popularity, due to high expectancy by actors in VCM that demand for REDD credits will come from compliance offset markets (Ecosystem Market Place and New Carbon Finance, 2015) though this eventually did not happen.

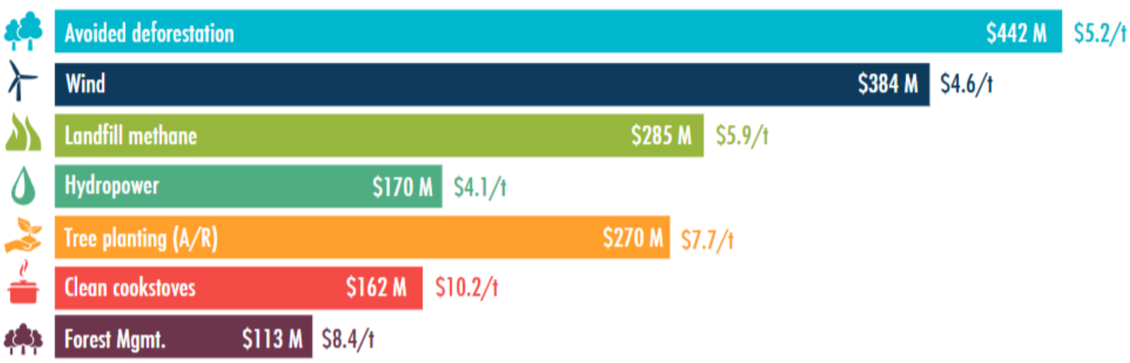

Figure 8 Cumulative Value and Average Price of Top 7 Project Types in VCM 2007-2014 (Ecosystem Marketplace and New Carbon Finance, 2015)

The case of VCM in the previous up to this era has been showing signs of the private sectors trying to get ahead the lengthy process of international climate negotiations and national bureaucracy, including in forestry sectors. This includes its endeavours in solving the complicacy of forestry projects regulation and concerns in the CDM, through establishment of various carbon project standards and additional certification for co-benefits (such as CCB) (Guigon, Bellassen and Ambrosi, 2009; Merger and Pistorius, 2011). VCM was maturing its carbon market ecosystem, leveraging the niche left by CDM and other lagging bilateral agreements in forestry sectors post-Bali COP.

This race between CDM and VCM in financing forest projects also reflected domestically. Indonesia government was facing a gap in financing its forest mitigation projects, with the Norway partnership became weakened as it failed to meet the phase 3 disbursement requirement, which is the proven emission reduction in forestry sector by 2014 (Angelsen, 2017). Indonesia was also struggling to generate forestry CDM projects, due to lack of resources in dealing with complexity in methodology (I12-MoEF2, I12-MoEF3). Although other sectors in CDM in Indonesia had grown significantly from only 12 in 2007 to 157 projects in 2014 (*CDM: Project Activities*, 2024), none of this came from the forestry sector. Meanwhile, REDD projects in Indonesia were also starting to get its fund through the VCM for international customers such as the EU and US. For example, in 2008, Indonesia's oldest and biggest REDD project, Rimba Raya, started its initiative in Kalimantan. This project was initiated by InfiniteEARTH, a Hong-Kong based project development company seeing the potential in generating carbon credits from Indonesia's forest conservation project (Indriatmoko *et al.*, 2014; Admin, no date). By 2009, it started its first VCS carbon crediting period (Indriatmoko *et al.*, 2014). In 2015, Indonesia became the top supplier of carbon credits in VCM, mostly from forestry projects (Ecosystem Market Place and New Carbon Finance, 2015).

Indonesian government also interacted and regulated VCM activities in Indonesia. For example, the licensing process of Rimba Raya took four years, with Ministry of Forestry problematized overlaps between Rimba Raya's area and oil palm concessions in 2010, and required the project developer to pay a USD 0.6 million licensing fee (Indriatmoko *et al.*, 2014). In 2012, Indonesian government released its first regulation regarding trading of forest carbon, in an attempt to regulate the growing forestry projects (KEMENHUT, 2012). This followed up with imposing a 10% fee on forest carbon credit transaction per ton of carbon (Government of Indonesia, 2014). Ultimately, in the experience of Indonesia, REDD institutionalization triggered VCM proliferation in financing forest carbon mitigation projects, whereas the CDM lacked behind, although RBP somewhat helped in developing strategy and policy reform in forest carbon mitigation projects.

Reflection on the introduction of REDD in Indonesia

REDD marked a pivotal first step in introducing a mechanism that aligned with the CBDR principle while addressing its limitations. It was envisioned as a win-win solution that would enable forest-rich developing countries to contribute to climate mitigation without compromising their developmental priorities. By providing financial incentives to reduce deforestation and enhance forest conservation, REDD seeks to integrate sustainable development goals with climate action. This alignment of environmental and economic objectives resonated with many developing countries, including Indonesia, which viewed REDD as an opportunity to leverage its forest resources as a carbon sink while accessing international funding.

The milestones in Indonesia's climate governance in this era reflect three qualities. First, the agile development of regulations regarding forestry to aid REDD institutionalization in Indonesia can be interpreted as Indonesian government's eagerness to adopt the new economic value of forest and the logic of economic efficiency that REDD introduced. This, along with the internationally driven effort in REDD institutionalization in Indonesia, further reinforced the relationship of the international donor-recipient relationship that was established in the beginning of the Kyoto Protocol. Second, the development of Indonesia's NAMAs in its RAN-GRK, further embedded the tension of aligning climate and economic development issue, reflecting a reformed version of sustainable development. Finally, the development of MRV framework can be seen as Indonesia's effort to increase its transparency and accountability in climate governance, as a consequence of the pressure to developing countries in this era of the Kyoto Protocol.

Nevertheless, Indonesia's experience up to this era in institutionalizing carbon market within the country had been driven by and to cater to international actors. The REDD establishment and a significant portion of Indonesia's early climate governance initiative in forestry sectors, inter alia, MRV establishment, land policy reform, forest conversion moratorium—all supported by Norway partnership (McNeill, 2015). Same case happened in its VCM activities, with international companies initiating carbon projects in Indonesia. Albeit it did partner with local actors for the implementation, the activity of carbon market in Indonesia was dominated by and made for international actors.

REDD then inadvertently strengthened the dynamic of developed-developing countries in terms of the establishment of carbon market institution. On the surface, it provided a win-win solution of utilizing forest carbon sink potential through incentive generated by the market (or aid, in case of RBP with Norway). However, it created a condition where forest conservation projects—and subsequently, the early conception of domestic carbon market in Indonesia—depended on international actors.

REDD's failure to connect into the compliance carbon market in the Kyoto Protocol also created a chasm in the domestic carbon market implementation in Indonesia. Indonesian VCM projects, catering for international companies and led by private initiatives, utilized REDD in the "actual" global carbon market, where credits are generated, transferred, and utilized to offset another entity. On the other hand, Indonesian government seems to interested in developing REDD projects for RBP mechanisms, following an aid-like situation as Angelsen (2017) said. Though both have some similarities in the sense that they count emission reduction from forest conservation, they do not share the same institutional structures. It was and is supported by different actors and it does not follow the same mechanisms and regulatory framework. The only similarity they share in Indonesia is that both are internationally driven. Figure 9 illustrates the progress of carbon market development in Indonesia.

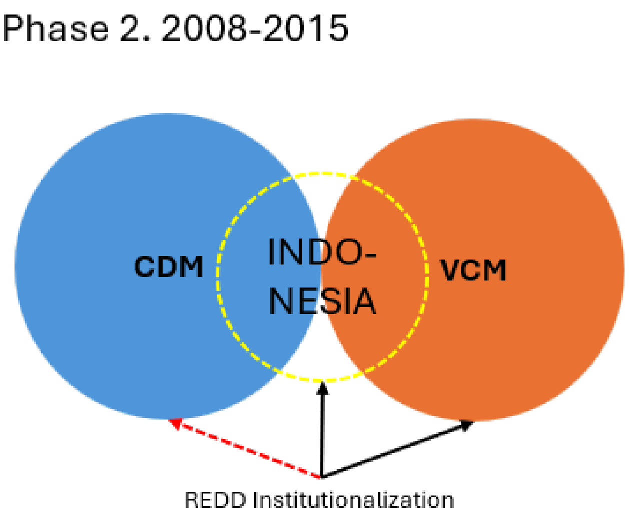

Figure 9 Phase 2 Carbon Market Development in Indonesia

Despite that, there was only minimal interaction between implementation of VCM and international compliance carbon market in Indonesia. Towards the end of the phase, only two regulations directly impacted the (forestry) VCM community, with the establishment of transaction fees for carbon credits and forest ownership regulation. Carbon market in Indonesia in this era then can be seen as just an extension of the global carbon market, with Indonesia further serving its prescribed role in the Kyoto Protocol dynamic, which is to provide emission reductions to be used elsewhere. Table 5 provided a summary of progress of development in the carbon market pillars.

Table 5 Pillars of carbon market in the second phase

PILLARS	INTERNATIONAL (CDM)	DOMESTIC MANIFESTATION	INTERNATIONAL (VCM)
REGULATORY	• Bali Action Plan	• REDD institutionalisation in Indonesia • Establishment of GHG Inventory and NAMAs • Establishment of DNPI and initial carbon market mechanism	• Fragmentation of VCM standards • REDD projects uptake in VCM
NORMATIVE	• CBDR meaning contested into international push for developing countries to take climate action • The needs of Annex 1 country to reduce emission	• REDD seen as incentives to protect forest and improvement for climate mitigation in Indonesia, from RBP and VCM • CDM as additional investment for clean energy projects in Indonesia	• Increased appetite for climate targets in private sector • Private leading public sectors in climate action

		• Increased transparency and ambition for all countries	
CULTURAL-COGNITIVE	• Non-Annex 1 country as implementor	• Carbon credit supplier for VCM (domestic) • Host countries for CDM • RBP recipient	• Carbon credit consumer (international)

Chapter 6—Phase 3: Preparation of Indonesia's National Carbon Pricing Initiative (2016-2020)

This chapter explains how the conception of Paris Agreement and the establishment of Nationally Determined Contribution (NDC) in Indonesia transformed the approach of climate governance in Indonesia from a more top-down approach introduced by RAN GRK (NAMAs) to a more decentralized, sectoral initiatives in NDC. Coupled with the change of socio-political situation, this era signified Indonesia's increasing effort to further institutionalize climate change issue into its national landscape. Though not yet legally established in this era, Indonesia's own carbon market mechanism was also under development. Through development of basic regulatory frameworks and launching of new governmental institutions, Indonesia was preparing the nuts and bolts for its upcoming carbon market mechanism. At the same time, during this time, VCM was gaining increase in demand globally, also reflected by its increased activity in Indonesia. The following sections discuss all these milestones, along with implications on the carbon market regulatory, normative, and cultural-cognitive pillars in Indonesia. Figure 10 summarized the milestones in this era.

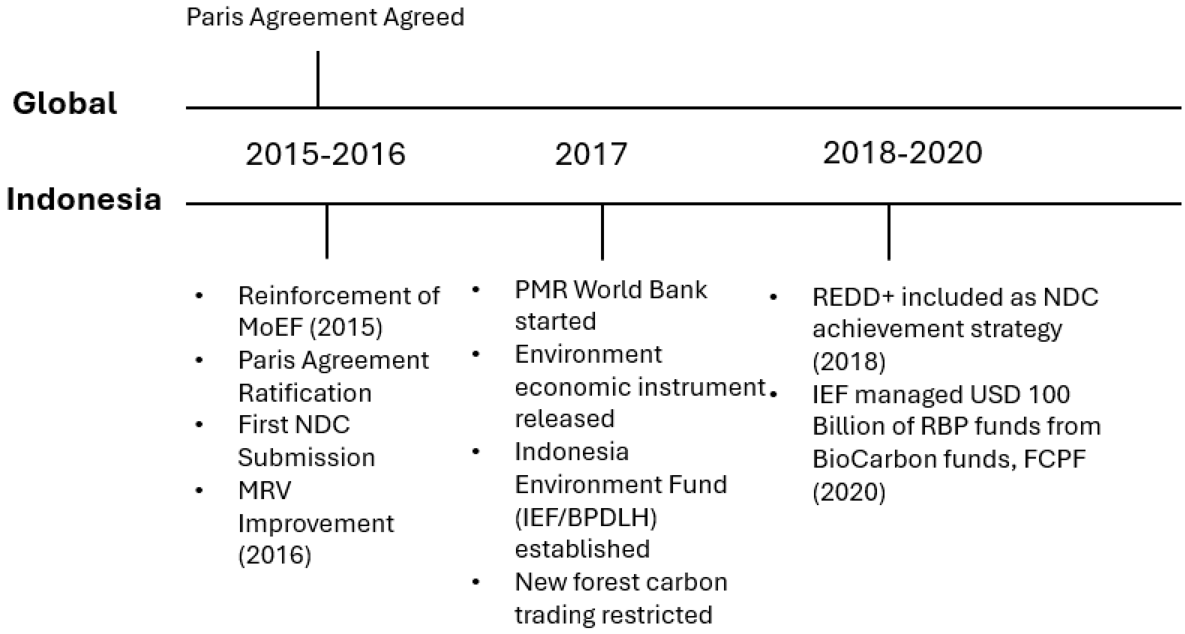

Figure 10 Timeline of Global Carbon Market Development (2016-2020)

Climate Governance in Indonesia under Paris Agreement Regime

The development of Paris Agreement was a culmination of the tension of a more universalized ambition in addressing climate change. As seen from the progress of the Kyoto Protocol, the reconceptualization and contestation of CBDR and SD became the normative basis of the change in the approach of institutionalizing climate change in international governance leading up to Paris Agreement. The discussion in Paris ended with agreement that all ratifying countries, including developing ones, to submit NDC and develop a more transparent climate reporting through the transparency framework (UNFCCC, 2016).

This progress in international climate governance trickled down to Indonesia. Two milestones in Indonesia' climate governance are important in shaping the dynamic of Indonesia's climate governance and its own carbon market development in this period. First, the restructuration of Ministry of Environment due to presidency change in 2014, and second, the ratification of Paris Agreement in 2016.

First, the presidency changes in 2014 created a strengthened institution of Ministry of Environment and Forestry (MoEF) to serve as a national focal point of Indonesia's climate governance. Through the merging of Ministry of Forestry, Ministry of Environment, National Council on Climate Change, and Indonesia REDD+ Taskforce under the new MoEF, this institution was strengthened and tasked to lead Indonesia's climate governance (Government of Indonesia, 2015). As outlined in the Presidential Decree no. 16/2015 regarding MoEF, which outlined the responsibility of MoEF in formulating and implementing policies on climate change mitigation, adaptation, including resources mobilization (Government of Indonesia, 2015). This shifted the focal point of climate governance in Indonesia as opposed to the previous period, where it was mainly under the National Development Agency (Bappenas), which had formulated National Greenhouse Gases Reduction Plan (RAN GRK) based on Indonesia NAMAs in the previous period.

An implication to this is that Indonesia was preparing itself to have a more bottom-up and decentralized climate governance. Though NDC overall target was determined nationally, its sectoral application and planning is mainly put into the hands of related ministries, in coordination with MoEF. Although strengthened institutionally, MoEF as a new focal point in climate change does not have the capability to direct development plan in Indonesia as Bappenas did, nor does it have a rigid output such as economic development plan like in the case of RAN GRK. Therefore, this change brought about a more flexible way to approach climate issues in Indonesia, with strategies that are more decentralized in various ministries.

Second, the milestone was the ratification of Paris Agreement by Indonesian government through Law no. 16/2016 (Government of Indonesia, 2016). This regulation did not only make the NDC achievement legally binding, but it also serves as Indonesia's first legal basis to build its own carbon market framework. Indonesia set a legally binding target to achieve its Nationally Determined Contribution (NDC). Indonesia's first NDC was to reduce 29% of emission with its own effort or 41% with international support by 2030 compared to 2010 baseline. This emission reduction targets encompasses five sectors: Forestry, Energy, Agriculture, Industrial Processes and Product Use (IPPU), and Waste Management. To achieve this, Paris Agreement allowed the nations to utilize the market mechanisms to achieve it under the Article 6 (UNFCCC, 2016). The following section discusses how this ratification and NDC setting introduces new pillars to Indonesian carbon market.

NDC as a nationalist agenda

As one of the primary regulatory pillars for the carbon market development in Indonesia, the ratification of Paris Agreement introduced and reinforced several norms that later guide the development and existence of carbon market in Indonesia. Two main norms are important to be highlighted in this law. First, is the reinforced acknowledgement of climate issue as a national agenda. Law no. 16/2016 stated that:

"...With increasing awareness of the threats posed by the negative impacts of climate change, addressing and controlling climate change is no longer a burden for the state but has become a necessity. Thus, the nation's commitment to addressing climate change is a national agenda." (Government of Indonesia, 2016)

and

"*...In the national context, climate change control is a constitutional mandate stating that every individual has the right to a prosperous life, both physically and spiritually, to reside and to enjoy a good and healthy environment, as well as the right to access healthcare services. The state provides guidance and has the duty to ensure that development needed to achieve the welfare of the people continues to consider environmental and social protection aspects.*" (Government of Indonesia, 2016)

These two sections reflected the start of institutionalization of "nationalist" norm that later will guide the development of carbon market development in Indonesia. Through the ratification of NDC, Indonesia institutionalized its effort of achieving NDC as its national agenda. This paved the way for NDC fulfilment to become one of the drivers of implementation of Indonesia's own carbon market development and created implications on its development.

Second norm raised and institutionalized in this era is supporting transparency in climate governance. Increased transparency has become one of the *spirits* of Paris Agreement. In the law, it is also stated that:

"*...A more effective and efficient multilateral approach is needed to implement climate change mitigation and adaptation actions, supported by funding, technology transfer, and capacity building, along with a transparency mechanism and sustainable governance.*" (Government of Indonesia, 2016)

This section supports the "transparency" norm, which require all mitigation efforts in Indonesia to be measured and reported towards NDC achievement, according to Monitoring, Reporting, and Verification (MRV) framework that Paris Agreement has.

Increased transparency in climate governance

The ratification of NDC in Indonesia not only put and institutionalize climate change as a national agenda, but also brought the underlying idea of setting up NDC in the global climate governance. As seen in the previous chapter, the dynamic of Kyoto Protocol transitioning into Paris Agreement shown an increased urgency in global climate governance to ramp up the ambition of all countries especially developing countries in terms of its climate ambition and transparency. Started by the Bali Action Plan, which evolved into Katowice Climate Package and subsequently Paris Agreement, this evolving global dialogue represented the urgency of this issue.

Reflected since the development and adoption of Katowice Climate Package, UNFCCC had long highlighted the needs to increase climate ambition and climate transparency between countries (UNFCCC, 2018). The Katowice Climate Package, adopted at COP24 in 2018, establishes comprehensive guidelines to operationalize the Paris Agreement, enhancing transparency, trust, and international cooperation. It provides detailed instructions on Nationally Determined Contributions (NDCs), including mitigation targets, timelines, and reporting standards, and sets up a robust transparency framework with flexibility for developing countries. The package outlines procedures for the Global Stocktake to assess collective progress, establishes a facilitative compliance mechanism, and enhances guidelines for adaptation communications. It clarifies financial commitments, including mobilizing $100 billion annually from developed to developing countries, and provides guidance on technology transfer, capacity building, and reporting on financial support. This milestone ensures consistent and ambitious climate action while addressing the diverse capacities of nations (UNFCCC, 2018).

In response to this, Indonesia undergone a transformation on its climate reporting system (see more Kamil, Bush and Gupta, 2021). Through a development of a more comprehensive Measurement, Reporting, and Verification (MRV) system to monitor and report on its climate actions, Indonesia answered the increasing international pressure on transparency. In 2016, Indonesia developed National Greenhouse Gas Inventory System (SIGN-SMART) and National Registry System (SRN) that will serve as two platforms for Indonesia's more transparent climate governance (Kemenko Perekonomian, 2019). Though similar, SIGN-SMART and SRN serve different purpose: SIGN-SMART focuses on accounting GHG itself, from national, local, and sectoral level, whereas SRN focuses on inventorying Indonesia's climate mitigation and adaptation efforts. Despite that, both conjointly support the increasing climate transparency needs in Indonesia.

Preparing the nuts and bolts in Indonesia's Future Carbon Pricing Initiatives

Along with the NDC establishment, in 2017, Indonesia also was supported by World Bank to implement Partnership for Market Readiness (PMR) in Indonesia. PMR is a platform provided by the World Bank, through the PMR programme. It provided funding for the implementation of the Market Readiness Programme to support Indonesia's development of carbon market framework. UNDP Indonesia Country Office had been appointed as the delivery agent responsible for project implementation. The Coordinating Ministry of Economic Affairs was the main government counterpart. In addition to this, the project also engaged various relevant ministries, including MoEF, Ministry of Energy and Mineral Resources (MEMR), Ministry of Industry (MoI), the Ministry of Finance, as well as the state-owned electricity state-owned enterprise (PLN) and industry associations. The project aimed to support the government to determine an appropriate market-based instrument (MBI) to reduce GHG emissions. This was achieved through the development of GHG emissions profiles and monitoring-reporting verification (MRV) systems in power generation and energy-intensive industries; and the development and piloting of a framework for market-based instrument (MBI) in Indonesia (UNDP, 2024). The recommendation of this program was included in a 2017 report of National Action Plan on integrated GHG reduction by Indonesian coordinating ministry of Economic Affairs (Kemenko Perekonomian, 2019).

Aside from PMR Indonesia, in 2017 Government of Indonesia also released Gov. Reg no. 46/2017, regarding Environmental Economic Instruments. This regulation was one of the most explicit acknowledgement of carbon as an economic instrument to help conserve the environment (Government of Indonesia, 2017). Two sections of this regulation are relevant for carbon market in Indonesia. There are two relevant mechanisms outlined in this regulation that resembled the carbon market.

First, is the payment for ecosystem services (Art. 10), and second, environmental funding (Art. 20-29). In Art. 10 of this regulation, carbon sink and storage are acknowledged as one of the ecosystem services that can be compensated through economic means, with compensation of said ecosystem services can be made from central or local government. Art. 27 of the regulation also stated that the fund for environment may include new financing schemes implemented by the government, such as investment returns, donations/charity, corporate social responsibility initiatives, *carbon trading proceeds*, loans, and other forms in accordance with applicable laws and regulations. Additional funding sources may come from, but are not limited to, the United Nations Framework Convention on Climate Change (UNFCCC) (Government of Indonesia, 2017).

Indonesia also established Indonesian Environment Fund (*Badan Pengelolaan Lingkungan Hidup BPDLH*/IEF) in 2019 (KLHK, 2019). IEF was established under Presidential Regulation No. 77 of 2018 as part of Indonesia's Ministry of Finance. It manages environmental funds to ensure sustainable financing for climate change mitigation, biodiversity conservation, and sustainable land management initiatives. IEF centralizes fund collection, allocation, and disbursement (which include proceeds from Indonesian carbon market) while collaborating with stakeholders, including government agencies, international organizations, and the private sector, to mobilize resources and implement environmental projects. It also monitors fund utilization and evaluates project impacts to ensure transparency, accountability, and effectiveness, supporting Indonesia's environmental sustainability goals (BPDLH, 2019).

A divergence in Indonesia's Carbon Market

NDC establishment provided a point of divergence in Indonesia's carbon market. Up to 2020, VCM and CDM in Indonesia had grown independently, though each with different story. Up to 2020, Indonesia issued 35 million of CERs through 157 CDM projects since the start of its implementation in 2005 (*CDM: Project Activities*, 2024). Still, until 2020, none of the CDM projects came from forestry sector. Meanwhile, VCM was dominating Indonesia's experience of carbon market upon its entry in 2009. Up to 2020, Verra had issued almost 50 million VCUs (Verified Carbon Units, equivalent to CERs) from Indonesia, 89% of which—almost 45 million VCUs—came from AFOLU (agriculture, forestry, and other land use) sector (*Verra Database*, 2024). Since 2013, AFOLU sector had been the lion share of Indonesia's VCM, following the increased appetite of private sectors for forestry projects following the institutionalization of REDD in the international climate governance (Ecosystem Market Place and New Carbon Finance, 2015; *Verra Database*, 2024). Figure 11 shows the growing share of AFOLU sectors project since 2009 in Indonesia, based on issued VCUs per year.

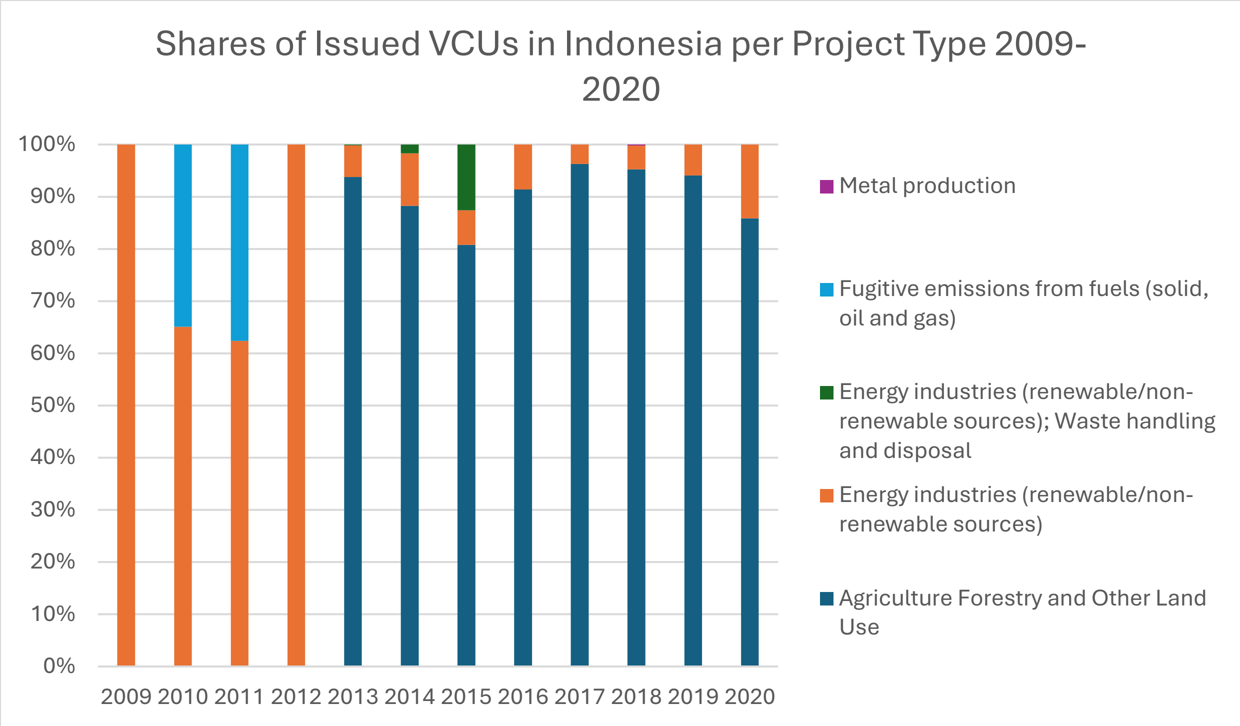

Figure 11 Shares of Issued VCUs in Indonesia per Project Sector (2009-2020) (Verra Database, 2024)

Post-NDC establishment, Indonesia needed to align its domestic market mechanism with the Paris Agreement. Ongoing CDM projects need to be aligned to Article 6 Mechanism of Paris Agreement, which outlined the approach of market and nonmarket mechanism in the Paris regime (UNFCCC, 2016). CDM was yet to be adopted within the Paris regime—and was particularly delayed due to debates around whether existing CDM projects can be accounted towards NDC achievement (Ahonen *et al.*, 2022).

VCM, on the other hand, has an awkward situation with the NDC. VCM projects cannot be counted towards NDC. VCM is based on the policy additionality, which requires a project to be proven that it will not happen based on the host country's government initiative alone (Battocletti, Enriques and Romano, 2023). With NDC "ambition cycle" that requires countries to increase its climate ambition every five years, it leaves less room for VCM (Ahonen *et al.*, 2022). At the same time, Indonesian government is now under increased pressure to fulfil its NDC, following the logic of "nationalist" agenda explained above. VCM's inability to be counted towards NDC conflict in Indonesian climate governance. In this era, first sign of conflict of VCM with Indonesian government also happened. In 2017, MoEF issued a circulation letter that prohibited forest business license owner to create new contract for carbon trading (APHI, 2017). This circulation letter stated that this prohibition was based on the ratification of Indonesia's NDC, and also the fact that Indonesian government was currently developing a new infrastructure to help account for and incentive modality in forest sectors.

This conflict was exacerbated with the increasing institutionalization of REDD+ and RBP mechanism in Indonesian climate governance. With the momentum of the Paris Agreement, Indonesia embedded REDD+ strategy as part of its NDC achievement strategy (KLHK, 2018). In addition, the newly established agency for managing environmental funds (BPDLH) was endowed with USD 100 billion of REDD RBP funds to manage; from BioCarbon Fund for landscape approaches in Jambi and Forest Carbon Partnership Facility for East Kalimantan (Moeliono *et al.*, 2020). Needless to say, RBP became Indonesian government's bread-and-butter in financing its forestry climate mitigation activities. As such, there was an increased competition for forestry projects in Indonesia—between VCM, which is primarily supported by REDD projects for international consumers, and Indonesian government, which is supported under the REDD+ mechanism, in connection to NDC.

Reflection on the Institutionalization of Paris Agreement in Indonesia

The introduction of NDCs under the Paris Agreement was a significant milestone in the global carbon market. As a consequence of redefining the CBDR and sustainable development principle, it eliminates the static differentiation between developed and developing countries as we saw in the Kyoto Protocol. All countries, regardless of their development status, were required to submit NDCs outlining their mitigation targets and strategies. NDCs are designed not only to achieve global emissions reductions but also to ensure that climate action is aligned with economic growth across countries with varying levels of development, embodying the idea of sustainable development. While this shift increased the accountability and universality of climate commitments, it also introduced complexities in the operationalization of the global carbon market.

In Indonesia's case, we saw how NDC paved the way to an improved climate governance. Driven with the "nationalist" agenda and "transparency" promoted by NDC, Indonesia improved its MRV framework, institutionalized REDD+ further, and created BPDLH to manage climate and environment related funds such as from RBP in REDD+ mechanisms. Nevertheless, it conflicted with the previously unregulated VCM projects that gained its prominence in Indonesia post-REDD introduction in international climate governance. The awkward situation that VCM had under the Paris Agreement exacerbated this issue further—its disconnect from Paris Agreement disincentivizes Indonesian government to include VCM projects in its endeavour of reaching climate targets. Instead, it became a ground for conflict between Indonesian government and actors in the VCM, although the conflict was still minimal up to this era.

As such, carbon markets in Indonesia saw its first overt conflicting fragmentation. During this era, the chasm in Indonesia's carbon market that was left behind after the failure of incorporating REDD in the compliance market during the Kyoto Protocol is widened. CDM lagged behind, waiting for its fate under the Paris regime. VCM became conflicting with Indonesia's government priority to fulfil NDC. REDD projects within VCM and RBP also became a covert conflict in Indonesia's carbon market. Figure 12 illustrates the progress of carbon market development in Indonesia.

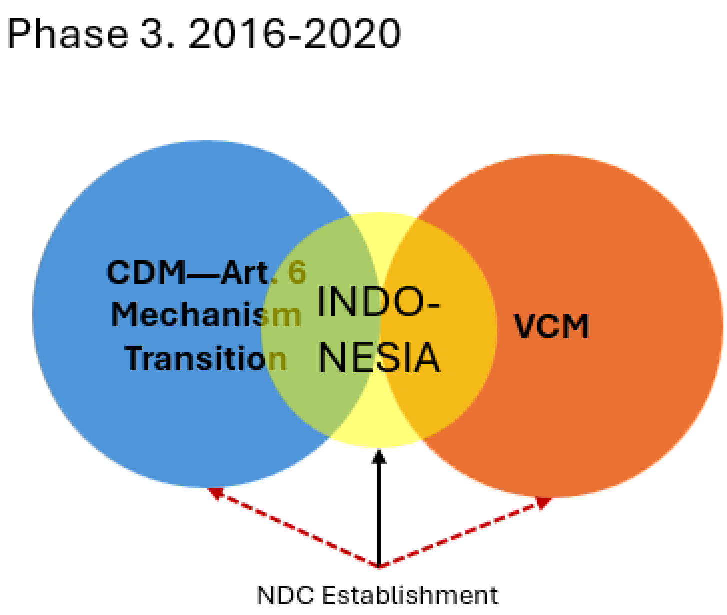

Figure 12 Phase 3 Carbon Market Development in Indonesia

Indonesian government, motivated by international donors and partnership in REDD+ mechanism, institutionalized REDD+ mechanisms in its climate governance, pinning it as one of the strategies to fulfil NDC. The race between government and VCM in financing forestry carbon projects as we see in previous period was further intensified in this era. Table 6 provides a summary of how carbon market pillars have evolved up until now.

Table 6 Pillars of carbon market in the third phase

PILLARS	INTERNATIONAL (CDM)	DOMESTIC MANIFESTATION	INTERNATIONAL (VCM)
REGULATORY	• Paris Agreement, transition from CDM to ITMOs	• Paris Agreement Ratification • Climate Governance Reformation • NDCs • Setting up Carbon Market Mechanism	• "Policy additionality" clashes with NDC under Paris Agreement scheme
NORMATIVE	• Increased transparency, more proactive and dynamic CBDR	• "Nationalist" NDC achievement • Increased transparency in climate mitigation	• Increased appetite for climate targets in private sector • Private leading public sectors in climate action
CULTURAL-COGNITIVE	• Developing countries expected to	• Increased sectoral coordination	• Further disconnect from the international climate governance,

	deliver climate targets	• MoEF as national focal point for climate governance • Increased government role in regulating carbon market activities	with blurring of voluntary and compliance carbon market

Chapter 7—Phase 4: Launching of Indonesia's Carbon Pricing Mechanism (2021-2024)

This chapter seeks to explain the launch of Indonesia's own carbon pricing mechanism and the following dynamics as well as its implication on Indonesia's climate governance and carbon market. Triggered by the release of Presidential Regulation (PR) 98/2021 on The Carbon Pricing Mechanisms, the launch set off entirely new regulatory pillar, along with reinforcement of norms and cultural-cognitive values that surround it. This launch also interacts with the previously existing pillars that have been discussed before. Figure 13 summarizes the milestone of this era.

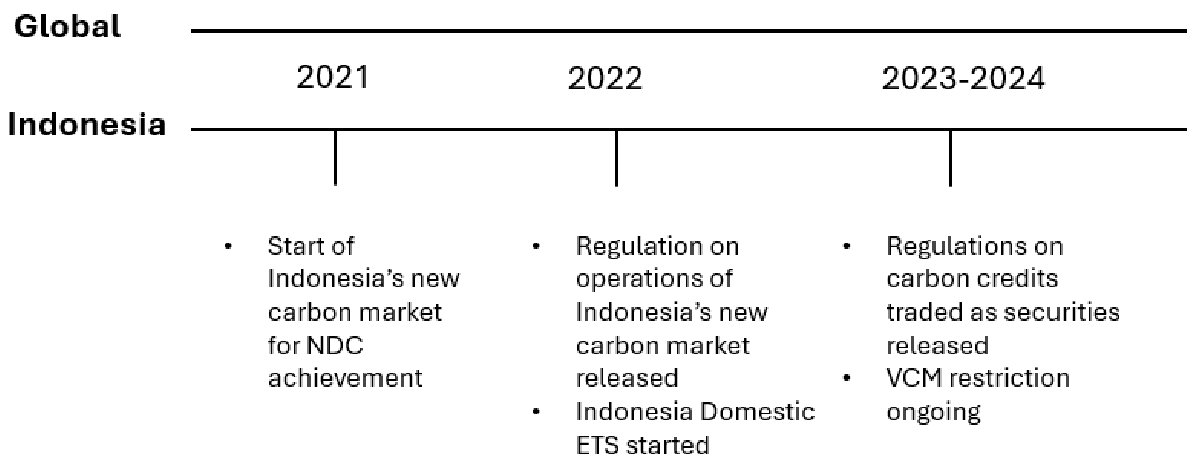

Figure 13 Timeline of Global Carbon Market Development (2021-2024)

Operationalizing Indonesia's NDC

On 29 October 2021, President Joko Widodo enacted the regulation of Carbon Economic Value (hereafter carbon pricing mechanism) in Indonesia, PR 98/2021. It was a major milestone in Indonesia's climate governance. Five years after Indonesia ratified Paris Agreement and submitted its first NDC, Indonesia released an umbrella regulation that led the way on how Indonesia would "control" climate change. There are three crucial points of this regulation that is of importance for this research. First, the regulation outlines how Indonesia would achieve its NDC targets. Second, it gives the framework to ensure transparency, monitoring, and evaluation of climate actions. Finally, it stipulates on how Indonesia would implement its carbon economic value, or carbon pricing initiatives (Government of Indonesia, 2021).

Regarding the achievement of NDC, a key point to highlight is how this regulation extends and reinforce the network of actors in climate governance by giving responsibility in implementing climate mitigation actions. Art. 6 of the regulation delegates the implementation of climate mitigation actions to not only national government, but also local government, as well as business entities and the public, in coordination with the ministry. Moreover, following the same delineation of Indonesia's NDC, it outlines five sectors of climate mitigation actions: including energy, waste, Industrial Processes and Product Uses (IPPU), agriculture, forestry, and others as technological advancements continue. Each of these sectors has several other sub-sectors, and the coordination of the implementation falls under specific ministries in Indonesia. The regulation urges an intense coordination between ministries, local government, and national government. The development of baseline GHG emission, determining the target and action plan of mitigation actions, both follows a multilevel approach that coordinate a multitude of actors in different level of governance. With that being said, a central power by the central government is still reflected in this regulation. Ultimately, all mitigation actions must be coordinated by the ministry, and will be aligned with the national development plan of Indonesia (Government of Indonesia, 2021).

An implication of this is an increased oversight of the government on climate mitigation actions implementations. This is not only done to align the implementation with the development plan of Indonesia, but also to the achievement of NDC and ultimately fulfilling Paris Agreement, which requires a transparent communication between ratifying countries regarding their actions and progress towards climate actions. Therefore, another crucial point in this regulation is ensuring the transparency and monitoring of climate mitigation actions.

PR 98/2021 extensively outlines how Indonesia would build its transparency framework nationally and align itself with NDC. Art. 60 states that all efforts to achieve NDC is done in an accurate, consistent, transparent, sustainable, and accountable manner. A key manifestation of the transparency framework in Indonesia is the establishment of its own registry system to track the progress of climate mitigation and adaptation actions. The national registry system is called SRN-PPI (*Sistem Registri Nasional Pengendalian Perubahan Iklim*/National Registry System of Climate Change Control). SRN-PPI serves as a platform to account all mitigation and adaptation actions, which includes both the ones that are in the market-based system and not. SRN-PPI also ensures that all actions accounted in the system are aligned and can be counted towards NDC achievement. In the following section, I discuss how this regulation gives structure in Indonesia's new carbon market institution.

Indonesia's New Carbon Market Institution

PR 98/2021 serves as a legal basis of the development of carbon pricing initiatives in Indonesia. The regulation states that carbon is a universal performance indicator for climate action which has both important economic value as well as international economic benefit. Art. 45 states that implementation of mitigation and adaptation actions in Indonesia can be done through the implementation of carbon economic value. With this consideration, the Government of Indonesia has made "carbon" as one of the instruments to accomplish Indonesia's mandatory obligation in GHG emission reduction under its NDC, while incentivising or commercialising the results of such action (Government of Indonesia, 2021).

The carbon pricing mechanism outlined in PR 98/2021 reflects the way market and non-market mechanisms are outlined within the Paris Agreement. The adoption of article 5 and 6 of Paris Agreement regarding the roles of forests, carbon sinks, and international cooperation in climate action. Article 5 encourages the conservation and enhancement of carbon sinks, including forests, and supports the implementation of the REDD+ framework to incentivize sustainable forest management, particularly in developing countries, with financial assistance from developed nations (UNFCCC, 2016). In PR 98/2021, this is stipulated in Art. 55-57 about Results Based Payment, which incentivizes achievement on GHG reduction through conservation or increasing the performance of carbon sink by a project or business entity (Government of Indonesia, 2021).

Meanwhile, Article 6, the market-mechanism, is translated into Art. 48-54 of PR 98/2021 (Government of Indonesia, 2021). By ensuring alignment with Paris Agreement, Indonesia's carbon market maximizes the potential of utilizing market approaches in the article 6, which provides mechanisms for international collaboration through trading carbon credits between countries, a UN-supervised mechanism to promote mitigation and sustainable development. (UNFCCC, 2016).

The alignment of Indonesia's carbon pricing mechanism with article 5 and 6 of Paris Agreement signifies Indonesia's effort in supporting the global carbon market to achieve global emission reduction as purposed by Paris Agreement. Indonesia government not only want to ensure that the operationalization of carbon pricing mechanism in Indonesia is supporting the NDC, but it also wants to ensure that it is beneficial, equitable, and promoting the support of developed countries in Indonesia's effort of curbing climate change.

Regulatory Landscape of Indonesia's Carbon Pricing Mechanism

There are four carbon pricing mechanisms that are regulated in PR 98/2021 (Art. 47), which are carbon market, results-based payment (RBP), carbon levy (or tax), and "*other mechanisms in accordance with the development of science and technology and decided by the ministry*" (Government of Indonesia, 2021). As such, carbon pricing mechanism in Indonesia encompasses both market-based mechanism and non-market-based mechanism. Table 7 summarizes different type of carbon pricing mechanism in Indonesia.

Table 7 Carbon Pricing Mechanism in Indonesia

Mechanism	*Traded Commodity*	*Unit*
Results Based Payment	None	-
Cap and trade/Emission trading	Emission allowance (PTBAE-PU)	Carbon unit (equivalent to one ton of CO_2e)
Baseline and credit	Certified emission reduction (SPE-GRK)	
Carbon tax/levy	None	-

The carbon market itself is further separated into two mechanisms (Art.49):

1. Cap-and-trade or emission trading system (ETS)
   This mechanism allows business entity to trade their emission allowance in the form of Technical Approval for Emission Allowance for Business Entity (*Persetujuan Teknis Batas Atas Emisi Pelaku Usaha*/PTBAE-PU).
2. Baseline-and-credit/offset mechanism
   Emission offset is the GHG emission reduction by business entity and/other mitigation action to compensate the emission produced in other activity. The commodity traded in emission

offset is Emission Reduction Certificates (ERC/Sertifikat Pengurangan Emisi Gas Rumah Kaca (SPE-GRK)).

The release of PR 98/2021 also accompanied by the release of its derivative regulation by MoEF, PERMENLHK 21/2022, which outlined in more detail how Indonesia's carbon market is implemented (KLHK, 2022b). In this regulation, it is outlined that the project cycle of carbon projects in Indonesia's new carbon market framework follows a cycle as illustrated by figure 14 below. (note: DRAM is *Dokumen Rencana Aksi Mitigasi*, equivalent to Project Design Description/PDD in CDM and VCM)

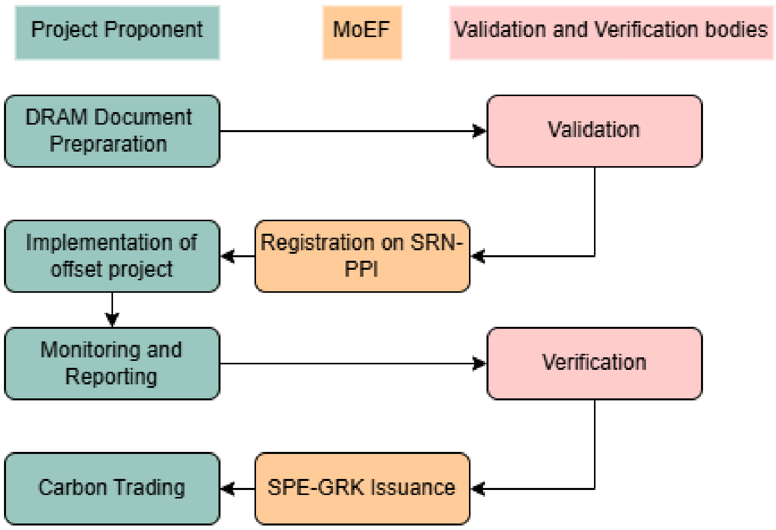

Figure 14 Indonesia's Carbon Market Project Cycle (Source: Author's summary)

To be able to conduct carbon trading, PERMENLHK 21/2022 also requires for related sectoral ministries to release further regulation to operationalize carbon market in their respective sector (KLHK, 2022b). This includes a strategy to achieve NDC as well as strategy for ETS and offset in said sector, among others; and it obliges coordination with MoEF in developing the strategy (KLHK, 2022b). To this date, only forestry and energy (power generation) sectors that have regulations detailing operationalization of its carbon market, both in ETS and offset mechanisms. The other remaining sectors of NDC—industry, agriculture, waste, and other subsectors in energy—are currently still under development (I12-MoEF1, I7-E2).

Carbon unit as securities instead of commodities

Carbon market in Indonesia also has a unique property, that it is regulated as a security instead of commodity. This decision is stipulated in another accompanying regulation to PR 98/2021, which is Regulation of Indonesia Financial Services Authority (FSA/OJK) no. 14/2023 (OJK, 2023). There are two implications of this regulations, first, it shows the increased involvement of financial sector in Indonesia's carbon market. Second, it reflects the institutionalization of the prevailing norms of seeing carbon market as an investment mechanism in Indonesia.

First, this regulation reflects the increased involvement of financial sectors in operationalizing Indonesia's carbon market. This regulation states that Indonesia's carbon unit is traded as securities, and to be traded, it requires for the carbon unit to be previously registered under SRN-PPI and the carbon exchange operator. As such, carbon market is not only subject to regulation by MoEF through SRN-PPI, but also under the carbon exchange operator under the FSA. In September 2023, Indonesian government also released IDX Carbon as its official carbon exchange operator (IDX, 2023).

Not only the carbon exchange operator, FSA Reg. No.14/2023 also strengthens the involvement of Indonesia's financial sector by giving standardization of brokers, exchanges, and intermediaries to operate carbon market in Indonesia (OJK, 2023). IDX Carbon also serves as a framework in the transaction mechanism of Indonesia's carbon market. It is used for both emission trading and offset mechanism. There are four mechanisms that can be done for carbon exchange of the offsets, which are regular, auction, negotiated, and marketplace (IDX, 2023). Figure 15 summarizes the differences between the mechanism.

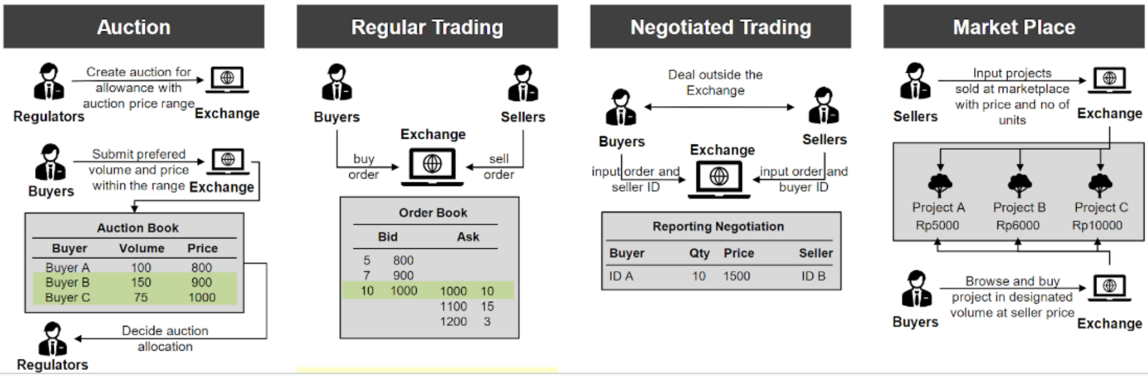

Figure 15. Mechanisms of Carbon Trading in IDX Carbon (IDX, 2023)

Second, this regulation is important to highlight because it represents the institutionalization of the prevailing norms about carbon market in Indonesia, which is seen as an incentive and investment mechanism. FSA Reg. No.14/2023 becomes a central basis of regulatory pillar of carbon market in Indonesia, which stipulates the legal acknowledgement of carbon unit as securities. The regulation states that securities are financial instruments or investment contracts that grant their holders the right to directly or indirectly obtain economic benefits from the issuer including any derivatives of securities, which can be transferred and/or traded in the capital market (OJK, 2023).

By treating carbon unit as securities, carbon unit is seen as an investment asset, which is subject to market liquidity and price volatility. This means that on a basic level, carbon unit from emission reduction activity is treated as a speculative instrument to generate income. This increases the tension of norms in utilization of carbon market, which supposedly primarily done to change the polluting behaviour-based approach, by internalizing the cost of pollution.

Indonesia's Carbon Market as Incentives and Investment Driver

The framing of Indonesia's current carbon market as incentive generating and investment driver is a prevailing norm that stems even from its early conception in Indonesia, as the previous chapters show. From Kyoto Protocol with the establishment of CDM, conception and subsequent institutionalization of REDD and RBP mechanism in Bali COP, the activities of VCM in Indonesia, to now the Indonesia's very own carbon pricing mechanism, all point that one of the main driving norms that sustain the activity of carbon market in Indonesia is to capture the value of carbon market.

Government stances also view Indonesia's carbon stock as an income generating opportunity. As an example, Joko Widodo, then President of Indonesia, stated that there is more than 3 thousand trillion IDR (57 billion EUR) potential from Indonesia's carbon that can be utilized if carbon market is implemented "properly" during the launch of IDX Carbon (KEMENSEKNEG, 2023). On a more marginal note, carbon market in Indonesia also supports the generation of state income. There are two ways to generate this state income, which are through carbon market transaction fee and administration fee (Government of Indonesia, 2021). These incomes will be pooled by IEF and will be allocated to further develop Indonesia's carbon market infrastructure and achievement of NDC (I14-IEF1, I14-IEF2).

This norm also translates to private sectors and business owners' actions. Currently, there is a big interest in developing carbon projects shown by an increasing number of project developers in Indonesia's carbon market scene, along with investors and landowners who seek to turn their land into AFOLU carbon projects (19-P4). Even more so, a state-owned-company acquisitioned another company to be its subsidiary to handle carbon trading activities, from developing projects to selling carbon units generated (I3-P1). An interviewee also stated:

"*Private sectors have a lot of interest in carbon credits due to the promising profit potential, especially in the forestry sector that has a relatively low initial investment cost compared to technological based in the energy sector. If 10$/ton (of carbon unit)"* (I5-E1).

Be that as it may, the value generation potential of carbon market hinges on a liquid market. It requires a stable supply and demand, both internationally and domestically. However, since its implementation, Indonesia's carbon pricing mechanism is still finding its way to maximize its value generation potential. IEF noted that transaction of SPE-GRK on the carbon exchange occurs but is not as large as anticipated due to imbalanced supply and demand, which led to decision by IEF and FSA deferring the collection of administration fee (I14-IEF2) as outlined previously. MEMR also noted that the implementation of current mechanism is still in its "learning" phase and "*there is little intention to generate state revenue for now, as the revenue is prioritized to be used for improving the mechanism and NDC achievement*" (I1-MEMR1). The following section explains further about the current dynamic of Indonesia's carbon market, tracing from the mismatch of supply and demand issue mentioned above.

Current Dynamic of Indonesia's Carbon Market Implementation

Indonesia's carbon market is experiencing a surplus of carbon credit supply. Currently, only the energy sector serves as the "compliance" consumer of Indonesia's carbon market, in the form of domestic ETS. Indonesia started its domestic ETS in the energy sector, initiated by the release of PERMEN ESDM 16/2022 (KESDM, 2022). It requires all coal-fired power plants that are connected to Indonesian Electricity Company (*Perusahaan Listrik Negara/PLN)* that has capacity more than 100MW to conduct ETS. To achieve the cap, coal-fired power plant can trade their emission allowance with each other or offset using SPE-GRK, strictly only from carbon projects in the energy sector (KESDM, 2022). There will be three phases of this ETS up until 2030, in each phase a wider participant and a more stringent cap is expected (I1-MEMR2). A clear data on Indonesia's emission trading sector cannot be obtained. However, on an online press release, MEMR reported that in 2023, carbon trading in Indonesia's power generation subsector achieved a total transaction value of IDR 84.17 billion, equivalent to 7.1 million tons of CO2 emissions (KESDM, 2024).

Despite this, Indonesian carbon market still faces an oversupply of credits. SRN-PPI has verified 1,805,254 tCO2e emission reduction in the SPE-GRK systems. These carbon units come from four carbon projects in the technology-based (energy) sector, which are geothermal, wind, mini-hydro, and natural gas. Meanwhile, there only have been 378,400 tCO2e SPE-GRK (around 20% of the issued) retired according to SRN-PPI. Over 97% of this retired carbon units come from the geothermal project (KLHK, 2024a) Figure 16 and Table 8 summarizes the amount of SPE-GRK verified and retired up until 2024.

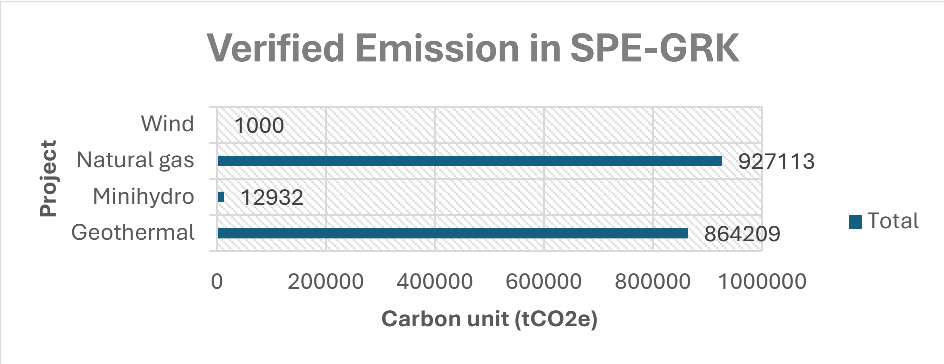

Figure 16 Verified Emission Reduction in SPE-GRK as per Nov. 2024 (KLHK, 2024)

Table 8 Retired SPE-GRK per November 2024 (KLHK, 2024)

RETIRED SPE-GRK	YEAR			
MONTH	2022	2023	2024	
JAN			170142	
FEB			5951	
MAR			188894	
APR			124	
MAY			3450	
JUN			494	
JUL			302	
AUG			1794	
SEP			603	
OCT		30	1164	
NOV		729	220	
DEC	1	4502		
GRAND TOTAL	**1**	**5261**	**373138**	**378400**

An interesting observation from Indonesia's offset mechanism data is that there is no AFOLU projects yet that are registered under the SPE-GRK system. Although both energy and forestry sectors are the most prepared sectors in terms of regulatory framework, both have a vastly different performances in Indonesian carbon market. Despite the high interest of forest business owners and investors that are explained before, there seems to be a delay in generating a nature-based carbon credits in current system. It is worth repeating that in Indonesia, AFOLU carbon projects are not new. As previous chapters show, Indonesia already have several AFOLU projects, especially in REDD programs. Therefore, it is not simply the lack of capacity of private actors that delays the generation of nature-based carbon credits. In the following sections, I explore some of the barriers in Indonesia's carbon market.

Counting carbons take some efforts

Methodology for quantifying emission in carbon offsetting projects seems to be one of the bottlenecks. Aside from the slowness of bureaucracy in issuing credits, private sectors complained that there is a limited amount of methodology that are approved by MoEF, and, to propose a new methodology would take a long time (I9-P4, I3-P1). Indonesian government holds a stance that methodology used to quantify emission reduction projects and issue carbon credits has to be approved by MoEF, except for methodology that are developed by national standardization agency or approved by UNFCCC (KLHK, 2022b). Currently, there are 49 methodologies that are approved by MoEF, as stated in SRN-PPI catalogue website (KLHK, 2024b).

Reflecting on the generated carbon credits, energy sector seems to have little problem on this. AFOLU projects, on the other hand, require a more complex technicalities to quantify the emission reductions, especially in the baseline settings (I10-E4). Furthermore, baseline settings in AFOLU offset mechanism projects are in conflict with RBP projects, which requires no overlaps between the two (KLHK, 2022b). This further exacerbates the conflict around AFOLU projects methodology. Summarizing the complexity of methodology in AFOLU projects lie beyond the scope of this research, but a pivotal point to be made is that there is an ongoing debate regarding the crediting process of AFOLU projects.

This methodology issue in carbon project extends further than the technicality of quantifying carbons. As one of the interviewees stated, "*carbon market is a trust-based business*" (I10-E4). It relies on a robust methodology to ensure the additionality and environmental integrity of carbon projects. Through a proven environmental integrity, market integrity in carbon market can be possible, and it seems to be a "chicken-and-egg" issue in Indonesia's current carbon market (I11-E5).

Looking at VCM as an example, market value of carbon credits increases along its environmental integrity, indicated with higher price for credits coming from recent vintage or additional certifications (I4-P2). Also, in 2023, Verra underwent a major controversy for its over-crediting issue (Greenfield, 2023). This lead to deactivation of some methodologies and a creation of a more robust and publicly consulted ones (Gupte, 2023). By undergoing this process, VCM increases its reliability in delivering an accountable carbon projects, increasing its legitimacy in international community, though criticism will always happen.

As a nascent institution, Indonesia's carbon market has not yet undergone this process. Additionally, Indonesian government commented that there are little knowledge transfers from

Indonesia's experience from CDM in the past to current development of Indonesia's carbon market, due to a small number of CDM project in Indonesia (I1-MEMR1, I12-MoEF2, I13, MoEF3).

As such, it is not surprising that there are a lot of actors that still have hesitancy regarding Indonesia's carbon market methodology legitimacy and accountability (I4-P2, I10-E4, I11-E5). Regardless, actors also expressed their interest in utilizing Indonesian standards for Indonesian carbon projects, although connecting to international private standards is favourable (I9-P4, I4-P2). Therefore, a mechanism in which these private standards can be mutually acknowledged in Indonesian system might help in jumpstarting Indonesia's robustness in methodology and increase its international recognition.

Indonesian government has stipulated the mechanism to mutually recognize private standards with the national carbon pricing mechanism (KLHK, 2022b). MoEF Regulation No. 21/2022 Art. 68 outlined the mutual recognition agreement, which enables certified emission reduction that is published by other certification body (or country) can be equated with SPE-GRK *after* the acknowledgement from the ministry. The regulation further stated that for an internationally published credit to be mutually recognized, the international MRV standard must be assessed for its compatibility with Indonesian standard. Four aspects are deemed important to be assessed, which are the methodology to determine baseline; monitoring, validation, and verification method; the competence of validator and verificatory required; and the registry system (KLHK, 2022b). However, in practice, this has not happened yet. To date, there are no clear procedures yet on how to do mutual recognition and/or converting existing VCM projects into SPE-GRK (I4-P2).

Challenges in nationalizing decarbonization norms

As previous section shows, there have been only 20% of the verified carbon units that are retired, meaning only a fifth of verified carbon units are used by private sectors (or other actors) to offset their emissions. From an NDC achievement standpoints, this is not a problem, because in the end those verified emissions are accounted towards Indonesia's NDC achievement anyway. However, this dampens the opportunity of Indonesia's carbon market in driving climate investment and internalizing the norm of decarbonization in carbon market in wider actors in Indonesia.

Private sectors admit that there is a significant challenge in selling Indonesia's carbon credits due to weak regulations implementation. For example, in the coal-fired power plants sector, the only sector that are right now obligated to do emissions trading, penalties have not been implemented yet to plants that exceed the cap (I3-P1). Consequently, there is low demand from the business entities to utilize offsets, as there are virtually no sanctions for their pollution.

"The carbon market did not emerge from internal corporate needs but from external pressures. Emission-limiting regulations creates the need for offsets. If regulations remain unclear, as they currently are, with only coal-fired power plant required to participate, demand will not develop. Furthermore, many companies are still unprepared to measure their emissions."

(I6-P3, translated from Indonesian)

The quote reflects that there is little internal motivation for companies to reduce their emissions. Without a stringent regulation, decarbonization will not happen right away. The development of this stringent emissions regulation is still ongoing. Currently, Ministry of Industry is developing baseline emissions for industry sectors, which also will come up as a roadmap for implementation in carbon market and cap for emission in industry sectors. There will be nine subsectors of industries that will be given priority, though the release of this regulation is still unannounced (I7-E2).

Several pioneering private sectors have ramped up their efforts in decarbonizing and internalizing climate change consideration in their business practices by setting up climate goals. One notable effort is the initiative by Indonesian Chamber of Commerce and Industry (KADIN), which collaborates with WRI Indonesia, BloombergNEF, UNDP, CDP, and WWF, setting up KADIN Net Zero Hub platform. This platform enables Indonesian private sectors to transition into a net zero businesses, by providing resources and guidelines, also introducing them to an international climate disclosure standard such as SBTi (Science Based Target Initiatives). By the last three years, private sectors have shown increased interest in this standard, with thirty-six companies are now comply with SBTi (I7-E2).

"*Decarbonization champions in Indonesia are typically multinational companies and companies affected by trade policies such as EU-CBAM (Carbon Border Adjustment Mechanism) and EU-DR (Deforestation Regulation). Examples include MNCs in textiles and FMCG (Adidas, Coca-Cola, H&M, Unilever), as well as sectors like iron and steel, pulp and paper, and agriculture. Additionally, the cement sector is also considered a champion in driving the decarbonization process in Indonesia.*" (I7-E2, translated from Indonesian)

With that being said, decarbonization as a norm can be seen still as an "international" norm. Without international push, private sectors are still rarely considering the path to transition into a low-carbon practices. Reflecting on Indonesia's carbon market (both CDM and VCM) experiences so far, most of the demand also comes from international, notably EU (I4-P2). This shows that, during almost 30 years of experience of carbon market in Indonesia, decarbonization as a norm can be considered to fail to materialize in the broader network domestic of private actorsExacerbated by a lax environmental reporting framework, decarbonization norms are pushed away from the mainstream of business practices, resulting in current weak domestic demand of offset credits in Indonesian carbon market.

Regulating the unregulated: VCM's fate under Indonesia's carbon pricing mechanism

One of the most significant impacts of the implementation of Indonesia's carbon market is the fate of VCM in Indonesia. By 2022, VCM virtually stops most of its activity in Indonesia, adding no new projects to be certified under international private standards, although transactions for older vintage are still happening. This situation leads to lots of problem on the ground, with diminishing funds to be utilized for conservation projects that are funded by VCM (I4-P2). As an interviewee said:

"*VCM seems to face a bleak situation, both domestically and internationally*" (I4-P2, translated from Indonesian).

Not only that, but conflicts also intensify between VCM and Indonesian government. As previous chapter recounted, Indonesian government was limiting the direct contract for carbon trading by forest business license owners, in a circulation letter to Indonesian Forest Industry Association (APHI, 2017). On 2022, MoEF wrote to Riau Ecosystem Restoration Carbon Project to retract its validation report by Verra, which the government claimed to be not in accordance of national laws and regulation (KLHK, 2022a). In 2024, MoEF suspended the land concession of Rimba Raya Conservation, one of Indonesia's largest and oldest REDD+ project. In fact, Rimba Raya Conservation is the first ever validated REDD+ under the Verified Carbon Standard. The suspension was based on the fact that allegedly, Rimba Raya transferred the license to a third party without approval by MoEF (KLHK, 2024c). However, recent development showed that Rimba Raya won its case after taking this allegation to Jakarta State Administrative Court, though to date its concession is not returned yet to Rimba Raya by MoEF (*TEMPO*, 2024).

Two main factors contribute to the challenging time that VCM is having in fitting into Indonesia's carbon market. First, as the beginning of this chapter extensively outlines, Indonesia's carbon market regulation requires all mitigation action in Indonesia to be accounted in NDC and registered in the SRN-PPI. Hence, there is practically no-room for non-NDC compliance mitigation activity, which what VCM is. Mutual recognition and transition mechanism to Indonesian carbon market system is also not yet fully functioning. This left VCM with little options. Some project developer explores the option to certify a project both under international private standards and national private standards, though this requires a double effort by carbon project developer leading to high transaction cost (I9-P4).

Second, international trading is currently restricted. As a business mainly driven by its international consumers, this is a though situation for VCM. Although Indonesia's carbon market regulation allows for international trading, its activity now requires approval by MoEF (Government of Indonesia, 2021; KLHK, 2022b). Aside from that, to approve carbon projects for international carbon trading, MoEF requires a prove that related NDC sector achievement is not compromised, and carbon projects are obliged to provide 10-20% buffer for NDC achievement (KLHK, 2022b).

Even then, the VCM limbo in Indonesia is a reflection to what is happening on the global scene. Since the enactment of Paris Agreement, VCM is still trying to find its place in the new regulatory landscape of carbon market but rather an ongoing worldwide debate since the enactment of Paris Agreement (Kreibich and Hermwille, 2021). Indonesian government is also taking a wait-and-see approach for the operationalization of article 6. Regarding international trading and linkage of VCM, MoEF stated that:

"*The main challenges are (from) international. Firstly, the Article 6.4 registry system is not yet ready. Secondly, the agreed electronic format for reporting is still under discussion. These challenges exist because Article 6.4 is centralized, with the supervisory body in Bonn, Germany, overseeing it, while countries only participate through the DNA.*" (I12-MoEF2, translated from Indonesian)

As understood, Article 6 Paris Agreement prohibits the claims of emission reduction if the credits have been purchased to offset emission in another country, to avoid double counting (UNFCCC, 2016). To date, there is not yet a unified consensus on how VCM would operate under a global carbon market established by Paris Agreement Article 6.

In essence, this debate boils down to different norms supporting each institution. VCM is driven with its private-led initiative, ensuring companies able to fulfil their net zero commitments through offsetting. Meanwhile, Article 6 mechanism of Paris Agreement is driven by an effort to centralize emission reductions targets of each country. Unsurprisingly, these two norms do not mix well, and it seems a consensus is still underway[1].

Putting the nation's first and foremost

A zeitgeist of this era of carbon market development in Indonesia is a sharpened nationalism issue in implementing carbon pricing mechanism. As prior sections suggest, this issue manifests itself into different pillar of carbon markets. The enactment of PR 98/2021 became the legal ground for Indonesian government to pursue its endeavour in regulating voluntary carbon markets. Supported by the needs for achievement of NDC and increasing transparency in accounting mitigation activity that are given by the transparency framework of Paris Agreement, Indonesian government set out to centralize climate governance in Indonesia, including carbon market.

Sovereignty over natural resources seems to be an underlying theme on these efforts. Carbon unit has a dual concept attached to it. It is both a unit that signifies amount of pollution, while at the same time it represents environmental resources, a unit signifying amount of emission removal or reduced. It seems that Indonesia is more focused on framing carbon unit as a resource, shown multiple times since the conception of REDD and subsequently its financialization through carbon credits and RBP to legitimate acknowledgement of carbon unit as securities. A significant focus put by the government into managing RBP partnerships agreement in Indonesia, which has value up to 700 million USD (I14-IEF1), also shows where the priority lies. Hence, as a resource, governmental intervention is deemed necessary and appropriate, in the basis of national sovereignty.

On the other side, current development of Indonesia's carbon market also introduces the dilemma of internalizing cost of pollution in the national economic system. Indonesia can be seen as not yet ready to claim the cost of pollution attached to carbon unit. Aside from the lack of preparedness from the private sectors that previous sections have shown, there is also consideration by government that the increased cost incurred by carbon pricing mechanism can be detrimental for national economic growth. For example, a comment by MEMR regarding emission trading:

"The current goal is to implement a fair system for business actors while emphasizing emission mitigation, as the primary purpose of the Emissions trading is to encourage power producers to operate more efficiently. A challenge in applying the polluter pays principle (in emission trading)

[1] Per November 2024, UNFCCC had agreed on the operationalization of Article 6 in the Paris Agreement during COP 29 in Azerbaijan (*COP29 achieves full operationalisation of Article 6 of Paris Agreement - Unlocks International Carbon Markets*, no date)

is that PLN's (Indonesia's state-owned electricity company) increased production costs for electricity could be passed back to the state to stabilize electricity prices." (I1-MEMR2, translated from Indonesian)

This idea is also echoed by the delays of implementation of carbon tax in Indonesia, in consideration of rising energy prices and overall economic growth (Putri, 2022). As such, it can be concluded that the other side of carbon unit is yet to be internalized by the broader networks of Indonesian actors in carbon market.

Reflection on Indonesia's Carbon Market Fragmentation

The introduction of NDC catalysed the development of Indonesia new carbon market institution. Recognizing the dual challenge of meeting its climate commitments while sustaining economic growth, Indonesia leveraged the flexibility of the NDC framework to integrate market-based mechanisms into its climate strategy. To operationalize its NDC, Indonesia began institutionalizing carbon market mechanisms, including the establishment of a national ETS and a domestic offset mechanism (SPE-GRK). However, this in turn creates conflict and complexities especially in two areas: interacting with the international carbon market in the VCM, driving domestic demand and capability.

As shown in previous section, Indonesia's carbon market development faces significant fragmentation. In this era, we see how Indonesia's own carbon market come to fruition, breaking off from its previous era where it was only an extension of VCM and CDM in the global carbon market. This new institution has major conflictive fragmentation with other carbon markets, particularly with VCM. Institutionally, efforts to align domestic frameworks with private standards and VCM remain limited, partly due to the lack of integration between VCM mechanisms and the Paris framework. This misalignment manifests as regulatory challenges, particularly in methodologies for verifying emissions reductions. While Results-Based Payment (RBP) mechanisms coexist with the carbon market, they sometimes conflict, even as their role remains strong and well-established. Figure 17 illustrates the progress of carbon market development in Indonesia.

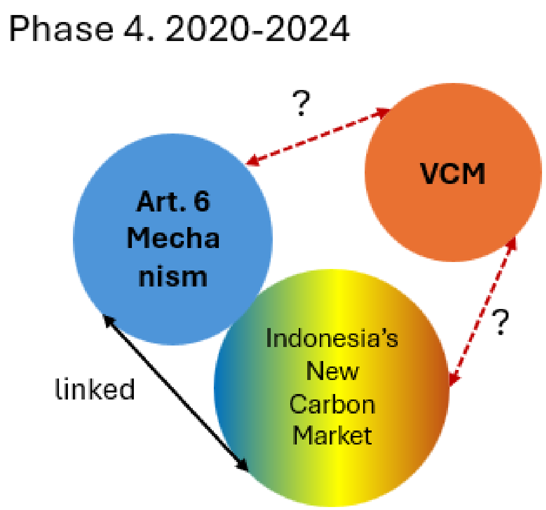

Figure 17 Phase 4 Carbon Market Development in Indonesia

Normatively, the internationally driven carbon market norms—shaped by VCM and the legacy of the CDM—emphasize international investment and trading, which conflicts with the government's domestic approach. The government prioritizes decarbonization and achieving Nationally Determined Contributions (NDCs) over the immediate financial returns promised by carbon markets. To this end, international trading restrictions, though aimed at safeguarding NDC achievement, have further constrained the Indonesia's carbon market potential.

This fragmented landscape forces actors to engage in intense coordination, often revealing divergent perspectives on how the carbon market should function. The sectoral approach adopted by various stakeholders acts as a barrier, with private actors demanding clearer regulations—especially on methodologies for validating emissions reductions—while the government exercises caution in approving methodologies. The government's increasing authority, legitimized through new regulations, has led to greater intervention in carbon market projects, creating tensions between regulatory oversight and market-driven flexibility. Table 9 summarized the pillars of carbon market of this phase of development.

Table 9 Pillars of carbon markets in the fourth phase

PILLARS	INTERNATIONAL (ARTICLE 6 MECHANISM)	INDONESIA'S CARBON MARKET MECHANISM	VOLUNTARY CARBON MARKET
REGULATORY	• Paris Agreement	• Indonesia' Carbon Market regulatory landscape	• VCM standards
NORMATIVE	• Transparency support from developed countries • Centralized market to fulfil nations' climate target	• "Nationalist" NDC achievement • Carbon market as an investment and incentives tool • Low domestic motivation to decarbonize	• Private-led initiative, decentralized and disconnected from international agreements
CULTURAL-COGNITIVE	• Ongoing debate surrounding Article 6 mechanism operationalization	• Increased government role, interventions and coordination between sectors and actors in carbon market	• Lack of ability to align with post-PA regime, limbo between complementing or stand-alone

Chapter 8—Discussion

The finding chapters have shown how the global carbon market was conceived under three evolving and interacting pillars, regulatory, normative, and cultural-cognitive. Underpinning all the norms is the social value of decarbonization in the global actors as promoted by UNFCCC. Aside from that, global carbon market is also supported by the pursuit of achieving sustainable development in developing countries, the assumed role of donors by developed countries—as promoted by the CBDR principle, and the seizing of opportunity in utilizing "cheaper" offsets with projects built in developing countries. The establishment of two regulatory pillars, REDD and NDC, shows how the norms mentioned previously are contested and evolved and provided the ground for fragmentation during almost 30 years life of global carbon market. As the cultural-cognitive role of developing countries evolves to take more accountability in climate governance, the global carbon market evolves and puts developing countries on a spotlight of carbon market institutionalization, such as in Indonesia's case. In this section, I discuss the institutionalization and fragmentation of the global carbon market in Indonesia, reflect on other global south countries' experience in carbon market institutionalization, deliberate over the implication of this fragmentation and future of global carbon market. Additionally, I also reflect on the theories and methodologies applied in this research.

Institutionalization of Global Carbon Market in Indonesia

The conception of global carbon market in Indonesia cannot be separated by the development of its climate governance. With the ratification of the Kyoto Protocol, Indonesian government started the institutionalization of climate governance and in consequence, the global carbon market. In this section, I discuss how the way global carbon market was manifested in Indonesia, from project implementation and governmental regulations, what norms that evolved and dominated, and the changes in cultural-cognitive pillar in Indonesia's carbon market.

Legal internalization of the Global Carbon Market in Indonesia

Through what Koh (1996) defines as legal internalization, Indonesia internalized the global carbon market as concepted by UNFCCC into the domestic legal system by executive action, judicial interpretation, legislative action, or some combination of the three. The milestones were listed exhaustively in the finding chapters. Two milestones in international climate governance spurred the internalization of global carbon market in Indonesia, which are the establishment of REDD in the Kyoto Protocol era, and the submission of NDC in the Paris Agreement.

Post-REDD, Indonesian government institutionalized carbon market through key milestone such as the development of REDD regulatory frameworks, the establishment of NAMAs and REDD institutionalization, and the development of National Action Plan to mitigate GHG emission. Indonesia's REDD institutionalization also allowed REDD VCM projects to be implemented through reforms of land tenure policies and forest governance. Although CDM projects lagged behind, we also saw a growing number of VCM forestry projects, implemented by international actors. In this era, the government also started few carbon market regulations in Indonesia, to regulate VCM.

Post-NDC, the institutionalization of climate governance and global carbon market in Indonesia continued. Indonesia reformed its climate governance to increase its accountability and facilitate a more transparent framework enforced by the Paris Agreement. This entailed in establishing

NDC, increasing role of MoEF in climate governance, improving the MRV system and emission reporting, and ultimately in the form of its carbon pricing regulation, through PR 98/2021. This carbon pricing regulation marked a point where Indonesia's carbon market was established as its own existing institution, signified with the development of domestic ETS, a national offsetting framework (SPE-GRK), and restrictive regulations with VCM in Indonesia. In the following section, I discuss what norms drive the global market institutionalization in Indonesia.

Localizing the norm of Global Carbon Market in Indonesia

The global carbon market, as discussed in the earlier sections, was conceived under several norms, mainly the social value of decarbonization, economic rationality, as well as the contested norms of CBDR and sustainable development. In Indonesia, while institutions for carbon markets and climate change exist, appears to show a limited dissemination of the social value of decarbonization across its domestic actors. It points to a "localization" phenomenon, where norms from international institutions are adapted and internalized. Localization, according to Acharya (2004), is a process through which external norms, ideas, or practices are adapted, modified, and internalized by local actors in ways that resonate with preexisting local values, beliefs, and practices. As such, in some way or another, Indonesia "localizes" the institutionalization of the international norms introduced by the global carbon market institution.

In the pre-Paris era of global carbon market in Indonesia, a prevailing norm adopted by domestic actors is the view of the carbon market as an income and investment generating tool. Supported by the static differentiation in the Kyoto Protocol as a result of CBDR principle, and further bolstered by the pursuit of sustainable development in developing countries, Indonesia internalized the global carbon market. As we saw in Chapter 4, primary motivation of ratifying the Kyoto Protocol was to gain CDM as a boost in investment for Indonesia's sustainable development. VCM experience in Indonesia in this era also amplified this perspective. Driven by international actors' appetite in "cheaper" carbon projects, VCM proliferated in Indonesia, particularly filling the gap in financing the forest projects in Indonesia that are not met by CDM. The social value of decarbonization was then filtered and reshaped by domestic actors to fit local priorities, which is to bring investment to Indonesia.

Post-Paris era, however, brought with it a revamped interpretation of CBDR and sustainable development norms in the form of NDC. The absence of clear differentiation in this latter stage of global carbon market development has blurred the lines of responsibility, creating a competitive dynamic where all countries are incentivized to achieve their emission targets at the lowest possible cost. NDC achievement became one of the primary norms supporting the establishment of global carbon market in Indonesia, hence the conflict with VCM. The disconnect of VCM with the broader global carbon market as established by the Paris Agreement becomes conflicting with Indonesia's new carbon market.

However, the lacklustre performance of Indonesia's new carbon market could indicate as an unintended impact of "localization" of global carbon market in Indonesia. The social value of decarbonization is filtered and reshaped by domestic actors to fit local priorities, often imbued with tension of keeping a sustained economic growth. This localization then, also limits the diffusion of norms in several elite actors (Acharya, 2004), in our case ones that primarily in contact with the experience of international carbon trading in the early global carbon market institution. As we can see with the lack of interest by domestic private actors in Indonesia to offset with Indonesia's new offset mechanism, the previous experience with CDM and VCM in Indonesia failed to introduce the norm of decarbonization aside from actors that are directly involved in those projects. Indonesian government lagged behind in utilizing the former experience of carbon market to mainstream the norms of decarbonization, prioritizing its economic value and appealing to international communities.

Evolution of cultural-cognitive values in Indonesia's carbon market

The institutionalization of global carbon market in Indonesia is marked with a persistent presence of international actors and increasing role of government in operationalization of carbon market. The persistence of international actors can particularly be seen from international actors that implement CDM and VCM in Indonesia, the partnership with Norway that helped Indonesia institutionalize REDD, and World Bank through Partnership of Market Readiness (PMR) that laid the base of Indonesia's new carbon market institution. Aside from all of that, we can also see how international actors strengthen the role of government in operationalizing Indonesia's carbon market.

Throughout the process of carbon market institutionalization, Indonesian government borrows its powers from international actors. Pre-Paris era, Indonesia fulfilled its cultural-cognitive role as prescribed by the Kyoto Protocol as a generator of carbon credits for international use. However, the pragmatic cooperation of CDM and VCM within Indonesia in REDD era changed post-NDC establishment. The effort to "regulate" VCM in Indonesia's new carbon market institution can also be seen as an extension of this goal. In Cortell and Davis's term, this shows how Indonesian government borrow international rules to justify their own actions and call into question the legitimacy of others (Cortell and Davis, 1996). In Indonesia's new carbon market institution, the government wields control over critical regulatory pillars, from approving methodology to quantify carbon projects, unclear process of mutual recognition of carbon standards, approving international trades with restrictive measures, and ultimately requiring all mitigation projects to be counted towards NDC. This in turn enabled Indonesian government to delegitimize the activity of VCM in Indonesia.

However, the internationally dominated sets of actors in Indonesia's carbon market also left the domestic actors not properly integrated into the operationalization of carbon market. Domestic actors unreadiness become an interlocking issue plaguing the development of Indonesia's new carbon market institution. Private actors' interest in developing carbon projects in the new system is not met with domestic actors' demand capacity to create a liquid, well-functioning carbon market domestically. Indonesia's recent development of domestic ETS in electricity generation sectors are proven to be inadequate in absorbing the influx of carbon credits generated in this new system, leaving an underperforming carbon market. In the end, the current development of new carbon market institution in Indonesia only serves as a catalogue of mitigation activities to be counted towards NDC, undermining its potential in driving behavioural change in emission reduction across wide domestic actors and driving climate investment. In the following section, I discuss this progress of national carbon market framework within the global carbon market.

Fragmentation of the Global Carbon Market

What supports the existence of global carbon market as an institution? Coming back to the theoretical framework that this research utilized, there are three pillars: regulative, normative, and cultural-cognitive (Knox-Hayes, 2010). However, inspecting only these pillars will not explain why the global carbon market is as fragmented as it is. As Biermann *et al.*, (2009) said, fragmentation is a result of an incremental process of institutionalization. Hence, the process of institutionalization—i.e., embedding process—of carbon market across actors be it in the form of nation-state and other global economic actors is what lead to the fragmentation. As multiple actors carry and contest the pillars of carbon market, incrementally the institutions within the global carbon market distinguish itself from each other.

One can also ask question on why this fragmentation happens. What leads to the multiplicity of institutions within global carbon market? To answer this, it requires us to draw insight from Polanyi (2001) and Granovetter (1985). Carbon market, as a market institution, is subject to influence of the society. It is enmeshed—or in Granovetter word, socialized—in the fabric of society, shaped with the social, political, and cultural context. As Knox-Hayes (2010) developed further, this leads to a dialectical relationship between the carbon market institution the institution it is embedded in. As such, socio-technical agency shape market function and operability, as we see on the evolution of the pillars of carbon market. In the following section, I discuss this fragmentation of global carbon market on a local and global level.

Fragmentation on a local level

Reflecting on Indonesia's experience, we can see how the localization of "norms" in the global carbon market leads to its subsequent fragmentation. We saw how previously cooperative—almost synergistic even—carbon market in Indonesia in the form of CDM and VCM become conflictive as Indonesia established its new carbon market institution. Chen and Xie (2023) explained this dynamic through observing the dynamic of VCM and compliance carbon market (CCM) in China. They argued that VCM and CCM, represented respectively as soft regime and hard regime, shares many institutional complementarities. Particularly, overlap between participants, operation rules, and market boundaries enable interactions to happen (Chen and Xie, 2023). In China's case, the authors observed that VCMs are squeezed out as the compliance counterpart matures, as seen in figure 18 below.

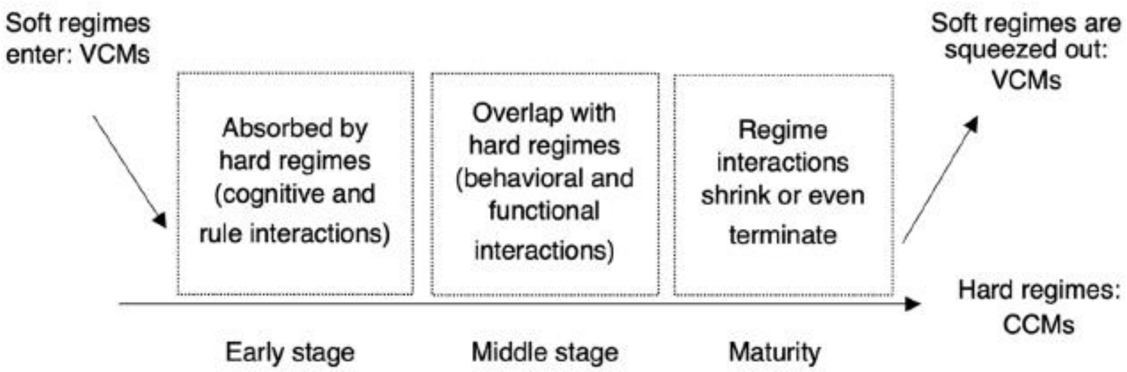

Figure 18 Regime interactions between voluntary and compliance carbon market (Chen and Xie, 2023)

Indonesia's experience is alike in this case. In the early stage, participant complementarity and especially the willingness of governments in target regimes to collaborate, is necessary for cognitive interaction to arise (Chen and Xie, 2023). We saw this interaction from Indonesia's past experience with VCM and CDM, a manifestation of global carbon market implemented by international actors. Undoubtedly, there were transfers and absorptions of capacity to domestic actors. Indonesia experienced how to deal with carbon projects and understood what kind of capacity it needed from development of carbon projects consultants, validation, and verification body. We also saw how institutionalization of global carbon market triggered the development of climate governance in Indonesia, including the MRV system, a crucial operationalizing factor in carbon market (Tuerk *et al.*, 2009). In its new carbon market institution, we even saw how Indonesia's carbon project cycle also resembled the CDM and VCM project cycle.

As Indonesian government developed its new carbon market institution, there was an increasing overlap of participant and market boundary in Indonesia's carbon market between the new institution and VCM. Indonesian government wanted participating actors to use SPE-GRK as its primary standards and restricted the use of private standards of VCM in its framework. The government also enjoys a highly dominant power to determine the timing and conditions of VCM entry and exit in regime interactions (Chen and Xie, 2023). Despite that, little can be said about the future of global carbon market in Indonesia: whether it will squeeze out VCM from its regime or integrate somehow. Indonesian government might take a wait-and-see approach, as VCM also still in limbo in post-Paris era of carbon market. If the integration of VCM cannot support of Indonesian government pursuit in achieving NDC, VCM might have a tough time in being absorbed in Indonesia's carbon market, leading to an even more conflicting fragmentation in the global carbon market.

Fragmentation on a global level

On a more global level, we first saw this fragmentation with the proliferation of VCM alongside the CDM. CDM and VCM both share the same normative underpinning of the social value of decarbonization, embedded by the actors within. However, its diverging history of actors lead to fragmentation between CDM and VCM (Paterson, 2012), though both are inextricably linked with each other. While CDM are promoted by nation-state in the UNFCCC, VCM initially was driven corporations to increase their environmental profile and demonstrate leadership (Corbera, Estrada and Brown, 2009). As both carbon markets grow, transactions of carbon market become more complex. To smoothen this, development of new institutions are developed to capture gains from trade (North, 1991). Synergistically, VCM serves as the “innovation sandbox” for offset mechanism, solving bureaucratic complicacy of CDM, as well as serving as add-on standards in CDM (Lovell, 2010; Benessaiah, 2012; Crowe, 2013). Due to the tendency of private system that evolves through competition and diversification, various private standards proliferate within the VCM (Ahonen *et al.*, 2022).

The increasing complexity of the global carbon market also has conflicting consequences. CDM and VCM competes in terms of scales, geographical context, and quality of impacts (Corbera, Estrada and Brown, 2009). The commodification of CO_2 in forms of various carbon market institutions also complicated harmonization efforts and allowing financial sectors to dominate, capturing value through prolonged chains of transactions rather than ensuring tangible climate benefits (Mol, 2012). As conflicts grow within institutions, resources will be devoted to measurement and enforcements (North, 1991), as we can see in the case of VCM and CDM proliferation of regulatory pillars in the gold rush era (Michaelowa, Shishlov and Brescia, 2019). This, in turn, created competition between the public and private sector, in the form of private regulatory organizations and intergovernmental organizations (Abbott, Green and Keohane, 2016).

Reflection of the fragmentation of global carbon market

In the previous sections, we have seen how carbon market as an institution evolves within the larger framework of global carbon market institution. More importantly, this research has shown how this evolution is enabled by the contestable and flexible nature of norms, carried by different actors in different carbon market institutions. This section discusses the theoretical implication of the empirical findings.

This research expands on what (Knox-Hayes, 2010) defined as carbon market institutions. The author prescribed how carbon market as an institution shape how actors behave, through establishing regulations including reward, sanction, and monitoring; prescribing common values; and constructing relationship between actors to define social reality with shared conceptions. Though highlighting the notion of the structuration and institutional theory to acknowledge an institution’s nature to be created, altered, and reproduced, Knox-Hayes (2010) inadvertently reinforces the stable nature of carbon market, unquestioning its evolving nature. In the previous section, I have shown how CBDR and sustainable development, as two out of many normative pillars of carbon market, changed and reinforced the global carbon market as an institution. This changing interpretations of the normative pillars of the carbon market gave rise also to different regulatory and cultural-cognitive pillars in the carbon market, as we see in the dynamic of post-Paris Agreement era.

Furthermore, utilizing Biermann *et al.* (2009) concept of fragmented global governance architecture on top of the institutional theories also leads us to shed some on why current international climate governance architecture, especially carbon market, became so fragmented. This research argued it is because the embedding process of the institution within different settings. Additionally, the overlapping roles of actors within global governance, i.e., government is both a sovereign power over its state but also part of an international climate negotiations, might explain why the evolution of global carbon market institution is complex and overlapping. This research also prove the notion on how “architecture” notion by governance architecture is devoid of an architect, as it is a result from incremental processes of institutionalization in international affairs that are decentralized and hardly planned (Biermann *et al.*, 2009).

This brings me to one of the highlighted limitations of global governance architecture concept. As Smits (2017) insinuated, the theory is focused on the positions of global governance dynamics and the roles of major powers of international politics (such as EU, US, UNFCCC) and less on smaller countries, nonstate actors, and intra-country dynamics. Utilizing this theory to Indonesia's case of global carbon market experience enriches me with an empirical evidence on the theory itself, as well as understanding the political difficulty in linking increasingly fragmented carbon markets (Tuerk *et al.*, 2009).

Combining institutional theories and global governance architecture theories also provides some answers on why current international climate governance architecture, especially carbon market, become so fragmented. Before going further in discussing the implication of fragmentation in the future of global carbon market, I discuss the insight from other global south countries in institutionalizing carbon market, as the hotspot of future fragmentation within the global carbon market in the form emerging of national and regional carbon market.

Drawing insights from the south's experience in global carbon market

The dynamics and complicacy in embedding global carbon market is also experienced in other countries. Notably, in the global-south, the development of carbon market is characterized with several aspects, such as uncertainty the role of private sector and civil society, challenges and shortcomings related to domestic demand, and a reliance on donors and multilateral banks to provide capacity building (Smits, 2017). This section then explores the dynamic of carbon market development to enrich the insight about the future of global carbon market, mainly drawing insights from China, India and Viet Nam. Three interrelated main points and insights will be discussed. First, the role of experience in global carbon market in developing domestic carbon market; second, directing the increasing role of government involvement in carbon market operationalization; and third, the need of solving complicacy in linkages of the growing number of domestic carbon market in global carbon market.

Ability to absorb and adapt the experience from global carbon market

Extensive experience in global carbon market in CDM and VCM does not necessarily mean a quick and successful implementation of domestic carbon market institution. There are many competing factors to ensure that experience of global carbon market will lead into a successful domestic carbon market institution, limited to the country's socio-political landscape.

In this section, I turn to experience of China, India, and Viet Nam for their differing experiences in institutionalizing domestic carbon market and share the same commonality being CDM's largest number of projects, the first, second, and fourth in the world respectively (Bui, Do and Nguyen, 2024; Jaspal and Mukherjee, 2024; Zeng, Faure and Feng, 2024). From 2013 to 2017, China progressively established ETS starting from pilot, provincial, to a national ETS, which currently become the world's largest ETS mechanism (Zeng, Faure and Feng, 2024). In contrast, Vietnam and India lags behind in the development of domestic carbon market mechanism, with India introduces its Carbon Credit Trading Scheme (CCTS) in June 2023 and Viet Nam planning on testing its carbon credit exchange by 2025, planned to be officially operating by 2028 (Bui, Do and Nguyen, 2024; Jaspal and Mukherjee, 2024).

One explanation to explains China's advancement in their domestic carbon market mechanism is their ability in adapting the international market mechanism CDM for its own priorities by adding own national requirements (Schroeder, 2009). China's growing economy and international importance forces the government to claim a more active role in remedying climate change, leading to establishment of ETS vested with interest to safeguard trade interests and national security. (Zeng, Faure and Feng, 2024). Its top-down, state-led strategy also smoothens strategic carbon market implementation in areas where it mattered, though this plagued with regional disparities as an after effect (Zeng, Faure and Feng, 2024). For example, in its CDM experience, China established provincial CDM centres to ensure CDM market aligns with Chinese market players (Schroeder, 2009). These provincial CDM centres serve as both the transfer of capacity from global carbon markets as well as ensuring alignment with diverse needs of local and national government (Qi *et al.*, 2008)

In contrast, India's and Viet Nam's experiences a modest progress on its domestic carbon market development. It has been noted that there is at least a strong potential for CDM in Viet Nam to induce habit formation in decarbonization from legal institutionalization, motivated by CDM's material incentives, although this seems to be limited by Viet Nam's government capacity in data sharing and sectoral coordination (Belis and Kerremans, 2016; Smits, 2017). Similarly in India, international CDM governance features are not transferred to the local context in a uniform manner but have been adapted to specific Indian circumstances, tainted with the public sectors inability to direct CDM experiences to build on the ability in developing private sectors capability in carbon market operationalization (Benecke, 2009). These arguments lead me to the second point of the discussion, which regards the increasing role of government involvement in carbon market operationalization

Directing the increasing role of government involvement in carbon market operationalization

Paris Agreement inevitably leads to an increasing oversight of government in various carbon market institutions due to the centralized nature of the global carbon market it tries to establish under the agreement (Ahonen *et al.*, 2022). Previous to Paris Agreement, the role of government was relatively small, with limited countries had little control over the procedures and methodologies developed under the UNFCCC (Smits, 2017). However, with a more bottom-up approach of Paris Agreement, the role of government is increased, along with developing transparency frameworks, sectoral coordination, to development of independent carbon market mechanism framework.

Therefore, the role of government in climate governance and carbon market operationalization needs to be streamlined in a way that it produces good coordination between parties within and outside the government to reduce fragmentation (Smits, 2017). China enjoys this streamlining process, with the dominating carbon governance pattern by state regulation and a highly regulated energy sector including with its national five year plan that includes national energy and emission saving plan (Schroeder, 2009).

Viet Nam and India, on the other hand, also experience a lack of unifying vision under the government to direct the implementation of its carbon market. Viet Nam does not have a legally mandated emission reduction target nor a national carbon credit framework that complies with international standards, transactions, sales, and transfers of forest carbon credits are subject to a rigorous screening process that is overseen by an international organization (Bui, Do and Nguyen, 2024). Without both, emission reduction policies and targets for sectors and fields remain ambiguous, resulting in private sectors' apprehensiveness in developing its climate ambition and utilize carbon market. This condition is exacerbated by the strong presence of energy sector, in the policy arena its perspective is driven by business rather than climate change concerns (Smits, 2017). In India, India's pioneering initiative on carbon market—the Perform, Achieve and Trade (PAT) scheme launched in 2012, which was the stepping stone towards India's new domestic carbon mechanism, is also plagued with intricacy in navigating the developing energy sectors and economic growth, limiting a more cross-sectoral application of its emerging carbon market mechanism (Jaspal and Mukherjee, 2024).

These sectoral issues highlight the need of government to serve as a leading actor in promoting not only the development of carbon market mechanism, but also instilling the norm of decarbonization across sectors and within its economic development. Without this leading role, domestic carbon market will face challenges in operating across wider sectors, limiting its decarbonization potential. On top of that, it will suffer in further emerging needs to connect with other carbon market mechanisms, with the need of increasing institutional harmonization within global carbon market mechanism (Tuerk *et al.*, 2009).

Solving complicacy in linkages of various carbon market

As Tuerk *et al.* (2009) suggests, the increasingly fragmented carbon market is plagued with divergent policy priorities of countries and regions, reflected in critical design features of its carbon market. A key challenge in addressing this fragmentation lies in resolving complexities in linkage. Enforcement mechanisms, such as robust monitoring, reporting, and verification (MRV) systems and compliance rules, are essential for implementing effective emissions trading systems (ETS) and achieving mitigation targets. To enable linking between schemes, each system must maintain credible MRV standards (Tuerk *et al.*, 2009).

China's initiative in developing a robust carbon market mechanism domestically again can be acknowledged. China is trying to strike a balance between a 'prudently timed implementation' and a need to 'hastily achieve emissions reductions', though burdened with its lack of solid emissions data and capacity of authorities (Zeng, Faure and Feng, 2024). This provides China with some leeway in deciding on how, when, and whether to connect with other carbon market mechanism, for example with the coming EU CBAM (Zeng, Faure and Feng, 2024). With the complex future of global carbon market mechanism, China's advancement in carbon market mechanism can be seen as an upper-hand to balance localization with global harmonization of carbon market rules, considering institutional contexts, dynamic policy priorities, and climate ambitions (Zeng, Faure and Feng, 2024).

Ensuring synergy in the fragmented global carbon market

The reflection of Indonesia's experience in embedding global carbon market, complimented with other countries in the global south experience has led us into reflecting the implication of such experiences for the future of global carbon market. This section explores the implication of fragmentation in the current global carbon market, drawing insight from global governance architecture. Subsequently, this section also questions the purpose of the global carbon market, reorienting its purpose in achieving deep decarbonization in all countries, while trying to hold on to the concept of climate justice that the CBDR principle introduced in its conception.

Is fragmented carbon market to be avoided?

What is a "strong" or "robust" global carbon market? Drawing from the governance architecture framework, a synergistic governance architecture is ones that has institutional, normative, and actors constellation integration (Biermann *et al.*, 2009). Reflecting this to the global carbon market, it is an institution where it can best instil the norm of social value of decarbonization across actors as wide as possible, leading to a deep decarbonization and institutionalization of low-carbon economic activities (Paterson, 2012).

Early global carbon market development contradicts this notion. True that, in favour of the proponents of "small-n number" of negotiators can increase the speed and participation within the global governance architecture (Biermann *et al.*, 2009), global carbon market institution was characterized with rapid involvement of actors in its operationalization. However, during the Kyoto Protocol era, global carbon market institution shares a resemblance to what Wallerstein (2011) defined as a core-periphery economy. Through inequal exchange and capital flows on the basis of carbon emission reductions under the Kyoto Protocol, this dynamic inadvertently reinforces the exclusivity of emission reduction towards developed countries. The economic rationality of generating "quantified emission reduction" to offset developed countries emission and the need to bolster the economic growth of global south countries with "sustainable development", point towards reinforcing this dynamic.

The interaction and fragmentation of carbon market post-Paris Agreement gives us an opportunity to rethink this dynamic. With the contested definition of CBDR and sustainable development within current international climate governance and the conflicts in current global carbon market institution, it forces us to give the centre stage towards developing nations in their journey of decarbonization. This, in turn, can create a higher degree of participation and equity, by enabling of developing countries in the development of global carbon market institution, imbuing and adapting it with their tailored needs and circumstances (Biermann *et al.*, 2009). The growing participation of emerging economic countries such as China, India, Vietnam, and Indonesia can be charted as the support of this notion. This also supports the notions that Biermann *et al.*, (2009) proposed, that global governance architecture is devoid of architect, it is merely the result of incremental processes of institutionalization in international affairs that are decentralized and hardly planned. Hence, fragmentation of global carbon market institution is unavoidable and, arguably, necessary.

The future of global carbon market

The fragmentation of global carbon market forces us to navigate the increasing complexity of fragmented carbon markets in the future. How can we ensure that as the global carbon market fragments and evolves, it retains its ability to reform the economic system? That it still brings various actors, be it in public or private sectors, developing or developed nations, in the decarbonization journey? Though it is convenient to not admit it, market-based instruments such as carbon markets, respond to signal from states. Unless the climate change negotiations make headway on new targets, the incentives for investors to participate in the buying and selling of carbon credits falls away (Newell and Paterson, 2010). If states fail to act as the promoter of carbon market as a functioning instrument to promote decarbonization, the trust in carbon market will wither, leaving us with carbon markets full of frauds and malfeasance at best, and a collapsing trust in carbon governance at worst.

Therefore, three points are important to ensure the future functioning of the global carbon market. First, we need to ensure that there is an incentive to promote synergies across actors. Second, there is a need to increase the meaningful participation and continuous development of the participants within the global carbon market. Third, there needs to be a shared understanding of the purpose of the global carbon market.

The promotion of synergies across fragmented in global carbon market can be credited to the development of the Paris Agreement. Its article 6, promotes the usage of market mechanism between countries, incentivizing countries that eager to utilize international support to develop its own carbon market in accordance with article 6 mechanisms. The utilization of this mechanism can trigger the emerging innovative mechanisms such as the nesting approach, and/or corresponding adjustments for achievement within and outside NDC (Müller and Michaelowa, 2019). Supported by the Paris Agreement global stocktake mechanism and various unilateral trading policies such as EU CBAM, it forces ratifying countries to develop their domestic carbon market to facilitate these situations. Through these efforts, countries that are not yet or are still early in its development of carbon market can find incentives in their practices. This effort might introduce streamlining effect in global carbon market, further enabling recently participating countries to deepen their commitments and participation (Sugiyama and Sinton, 2005).

This brings me to the second point of the discussion, which is a need to increase the meaningful participation and continuous development of the participants within the global carbon market. To achieve this, the unique socio-political situation of the emerging carbon market mechanisms needs to be considered more carefully. Development agents that promote carbon market as climate policy instrument such as World Bank, needs to consider the role of interests, agency, and legitimacy in the targeted countries effort in initiating and responding to change (Dacin, 2002). Moreover, local actors action and initiative in adapting international norms and institution should be given more focus, considering them as an active actors in localizing international institution (Acharya, 2004). This includes understanding the vested interest of the government in utilizing carbon market, as we can see in Indonesia's case. Overseeing the establishment of carbon market infrastructure is not enough, there needs to be a more critical steps taken towards ensuring that the purpose as well as the nuts and bolts of carbon markets—such as environmental reporting, law enforcement, and various disclosure mechanisms—are prepared. It should also be noted that this effort could be extended to not only the central government, but also subnational levels, private actors, as well as the general public within the country. With these efforts, global carbon market can also strengthen local norms on social value of decarbonization, not making it as an international norm only.

Finally, and the most critical point is to ensure a shared understanding of the purpose of the global carbon market. We need to question ourselves as to why the global carbon market is conceived and reflect the conflicts within so far. How can we ensure that future global carbon market strikes the balance between economic rationality and climate justice? We need to ensure to not repeat the CDM's tendency on contributing realizing certain dimensions of climate justice, while considerably subverting others (Shrivastava and Bhaduri, 2019), or with VCM's inclination to inflate its claim to boost its profitability (Battocletti, Enriques and Romano, 2023).

In achieving this decisive point, the actors within global carbon market need to ensure that it favours the increasingly difficult way to decarbonize. The regulatory framework within should be developed in a way that it is directing fundings towards more innovative carbon reduction technologies and ensuring technological diffusions. It also needs to safeguard itself from projects that inadvertently promote entrenchment in an emission intensive economic development, as well as ensuring the promotion of wider, equitable economic development. The establishment of NDC in developing countries, for instances, should promote VCM and Article 6 mechanism to fund for projects beyond the countries' submitted target, outperforming its registered ambition in the Paris Agreement.

Overall, the wicked, far-reaching, and universal nature of climate change issue is in fact an opportunity to develop synergy within the global carbon market institution. Its diverse impacts on many aspects of livelihood, should push the actors to develop increasingly innovative solutions to deal with climate change through various policy instruments, including but not limited to the market mechanism. Market-based mechanism should not be seen as an instrument that limits the way we tackle decarbonization and climate change issues—or in what Methmann (2013) said, depoliticizing climate change without questioning its fundamental societal structures implication. In contrast, it should bring us together in critically looking our market failures in current economic system and push us forward in revolutionizing the future.

Reflection on Methodology

My experience in conducting qualitative research to trace the development and institutionalization of carbon markets in Indonesia required me to be flexible in understanding the global context of carbon market development as well as the domestic context within. Through combining literature reviews and interviews, it enabled me to a richer understanding of how carbon markets have been institutionalized in Indonesia. This approach provided a means to examine the intersections of global frameworks and local contexts, as well as the diverse interests and priorities shaping the market's development. Regardless, several difficulties persisted throughout the research.

First difficulty is navigating Indonesia's evolving regulatory landscape, which has shifted from the early alignment with the Kyoto Protocol to its more recent development under the Paris Agreement. Capturing these changes required tracing historical shifts in the country's regulatory frameworks, while trying to capture the socio-political context that underlies the situation.

Another challenge emerged from the diversity of perspectives among the stakeholders interviewed. Government representatives, civil society organizations, researchers, and private sector actors brought contrasting priorities and narratives, reflecting their distinct roles and interests in the carbon market. Synthesizing these diverse viewpoints while trying to not fall into confirmatory bias with my own initial assumptions about Indonesia's carbon market development is challenging. Throughout the research, I have tried to actively reflect on the findings research, including challenging initial interpretations, seeking alternative perspectives, and deliberately engaging with critical viewpoint especially through literatures.

Ultimately, I find the challenge in handling the qualitative nature of the research is to balance between breadth and depth. Carbon market and climate governance is a highly discussed issue. Tracing carbon market development over decades involved a broad view of institutional changes while delving into specific cases, with various focuses on its justices, technicalities, and institutional interaction. The interplay across global, national, and subnational scales further complicated this process, requiring reflexivity to ensure findings remained grounded and contextually sensitive.

Despite these challenges, I find the utilization of both institutional theories and governance architecture provided me in a flexibility in understanding and issue as complex as carbon market. It enabled me to go back and forth between the global, international context—that provides context in Indonesia's institutionalization of climate governance and carbon market—and juxtaposed it with Indonesia's progress and socio-political situation. It also allowed me to trace the incompatibility of early global carbon market institution with current situation, which resides in the uneasy mix of climate justice and economic rationality.

Chapter 9—Conclusion and recommendation

This research is situated under the backdrop of increasing fragmentation of global carbon market post-Paris Agreement (Ahonen *et al.*, 2022). To understand the origins of this fragmentation, what causes such fragmentation, and what would the implication be for the future of global carbon market under the Paris regime, this research turns into Indonesia's experience of institutionalizing carbon market. By inspecting the evolution of carbon market institution in Indonesia, this research aims to understand how the regulations evolved, what were and are the drivers and norms, and how the actors' role changes over time within Indonesia's carbon market. Figure 19 summarizes Indonesia's progress of institutionalizing carbon market domestically.

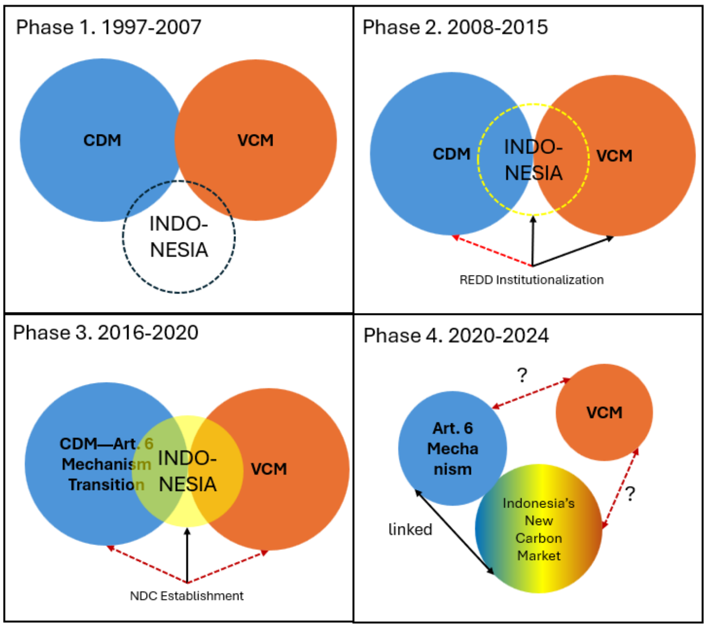

Figure 19 Indonesia's Progress in Carbon Market Institutionalization (Source: Author)

Indonesia's experience provides an insight on a particular challenge that might arise especially for developing countries that are developing their own carbon market framework. We saw how Indonesia "pruned" the global carbon market, highlighting only the "carrot" part of the carbon market, and neglecting the "stick" part of it. As developing countries turn to develop their own carbon market framework, these countries need to somehow turn their experience in previous global carbon market to develop their own domestic actor's readiness to not only utilize the incentive provided by the market mechanism, but also the internalization of cost of emission.

In this research, I highlight two major milestones in international climate governance that are highly influential in Indonesia's carbon market institutionalization and progress in climate governance: REDD and NDC establishment. These two milestones are important in showcasing the evolving nature of global carbon market institution. Both regulatory milestones reflect a manifestation of contested norms and roles prescribed by the earlier conception of global carbon market, and in turn, it affects Indonesia's development of carbon market.

REDD and NDC helped trigger development of various climate governance and further embedded global carbon market in Indonesia. REDD also confirms and reinforces the utilization of carbon market as an investment generating tool in Indonesia, bringing in income both in the form RBP and VCM. REDD then inadvertently strengthens the internationally dependent nature of Indonesia's carbon market that was started during the Kyoto Protocol. NDC, on the other hand, served as a point where Indonesia established its own carbon market institution. It paved the way for Indonesian government to have more control in the operationalization of its carbon market, in the name of NDC achievement.

This research also showed that the regulatory complexity in operationalizing carbon markets in current fragmented global carbon market reflects a deeper issue unique to a country's socio-political condition. For example, operationalization of carbon market in Indonesia post-NDC establishment is imbued with nationalist agenda—a significant focus is put for domestic actors to register their mitigation activities for NDC achievement, and restrictive measures are taken for VCM that might harm Indonesia's achievement of NDC. However, Indonesia's previously internationally driven carbon market operationalization provided a challenge in growing domestic actors' capability in building a liquid domestic carbon market. Exacerbated by lax environmental regulation enforcement and reporting framework, as well as underdeveloped emission reduction targets for various sectors, domestic actors are yet to be pushed to utilize Indonesia's new carbon market.

As Paris Agreement prescribed a more centralized global carbon market under the Article 6 mechanism, more countries will develop their own carbon market framework. Hence, a shared understanding by nation-states in operationalizing carbon market is crucial as the global carbon market fragments further. Regardless, this research shows that the challenge in the future of global carbon market is providing a market-mechanism which both supports economically efficient emission reduction while also acknowledging the difference in capabilities and responsibilities of developing nations in funding climate actions and pursuing their economic growth. In the following section, I outlined recommendations for Indonesian government to address these challenges.

Policy Recommendations

Reflecting on the conclusion, this research provides several recommendations for Indonesian government in developing a more robust carbon market in Indonesia and navigating the fragmented global carbon market. I divide this recommendation to two parts, for domestic actors and international communities.

First, for domestic actors, I borrow the logic of "state internalization" by Alderson (2001) to address the "pruning" of global carbon market in Indonesia's experience. State internalization refers to the process by which states internalize norms arising elsewhere in the international system and situated it in relation to contrasting and cognate terms (Alderson, 2001). State internalization also aims for normative institutionalization not just behavioural compliance (Alderson, 2001). In Indonesia's case, the challenge of its domestic carbon market is constructing the social value of decarbonization in domestic actors as prescribed by the global carbon market. As such, Indonesian government should actively "institutionalize" decarbonization in various policy instruments, not only in the form of a market instruments.

The institutionalization of decarbonization as a norm should take form from the ground-up. First, Indonesian government should improve its environmental reporting for domestic private actors that includes and streamlines emission reporting processes. This step is imperative because it is impossible to control what are not measured. Second, Indonesian government should make decarbonization unavoidable and emission generation expensive and discouraged. To achieve this, regulatory uncertainty and enforcement regarding environmental regulation in Indonesia should be addressed. This step is important to create an atmosphere where decarbonization as a norm become acceptable and routine by domestic actors. The discouragement of emission generation can also be materialized by further influencing financial sectors in terms of consideration of environment, social, and governance (ESG) risk. This could drive domestic actors in Indonesia in adopting a more low-carbon approach in their business activities, further internalizing the norms of decarbonization in their practice. Finally, Indonesian government should also ramp up its sectoral coordination in terms of NDC achievement. This is done not only to provide a clear regulatory ambition by the government to let the private sectors adapt, but also addressing the cross-sectoral nature of emission generations.

Second, for the international communities, I turn to the concept of norm entrepreneurs by Finnemore and Sikkink (1998) to promote a more "just" global carbon market. A challenge for the future global carbon market left by the legacy of CDM and VCM is the conflicting drive of developing countries to utilize the global carbon market as a support for their own climate mitigation achievement and economic development while fulfilling their increased ambition under the NDC. Throughout this research, we have seen how the global carbon market evolves by the contestation of norms that support the institution. Therefore, moving forwards, "norm entrepreneurs" that can direct the operationalization of a just global carbon market is crucial.

There are several aspects that Indonesian government can do to act as a norm entrepreneur. First, Indonesian government should acknowledge Indonesia's VCM major share in Indonesia's carbon market and utilize this opportunity to promote VCM connection into Paris Agreement. This effort can be started by smoothing the process of mutual recognition of standards between the new Indonesia's carbon market institution and VCM standards. By connecting these standards, it forces VCM that operates in Indonesia to comply under NDC while also at the same time providing connection to the existing resources and international consumers that VCM in Indonesia have developed. True, that this entails some compromise by the Indonesian government for some projects might not account for NDC achievement due to being internationally traded, but this could lead into a more liquid domestic carbon market and synergistic global carbon market. Second, Indonesian government can act as a more proactive negotiator in the international climate governance in the operationalization of Article 6 mechanism that is more beneficial for developing countries. This might take form in a more innovative approach in ensuring benefit sharing mechanism in Article 6 and safeguarding process of sustainable development that are crucial for developing countries. In doing so, the economically efficient emission reduction provided by the market mechanism can exist hand in hand with providing support for developing countries in pursuing a sustainable, and low-carbon economic development.

Future research agenda

Moving forward, future research can provide a more comprehensive and equitable understanding of the institutionalization process while addressing the broader implications of climate justice and governance. As seen in Indonesia's case, previous experience in the global carbon market might entail in an insufficient institutionalization of carbon market in the domestic framework. Therefore, other countries' experience, especially the global south who were the provider of carbon credits in the Kyoto Protocol era, should be looked more critically. Future research needs to ensure that these countries can adopt and utilized market mechanism in their climate governance that will promote low-carbon development as well as ensuring justice in the future of global carbon market.

References

Abbott, K.W., Green, J.F. and Keohane, R.O. (2016) 'Organizational Ecology and Institutional Change in Global Governance', *International Organization*, 70(2), pp. 247–277. Available at: https://doi.org/10.1017/S0020818315000338.

Acharya, A. (2004) 'How Ideas Spread: Whose Norms Matter? Norm Localization and Institutional Change in Asian Regionalism', *International Organization*, 58(2), pp. 239–275. Available at: https://doi.org/10.1017/S0020818304582024.

Admin, I. (no date) 'About InfiniteEARTH', *InfiniteEARTH*. Available at: https://infinite-earth.com/about-infiniteearth/ (Accessed: 24 December 2024).

Ahonen, H.-M. *et al.* (2022) 'Governance of Fragmented Compliance and Voluntary Carbon Markets Under the Paris Agreement', *Politics and Governance*, 10(1). Available at: https://doi.org/10.17645/pag.v10i1.4759.

Alderson, K. (2001) 'Making sense of state socialization', *Review of International Studies*, 27(03). Available at: https://doi.org/10.1017/S0260210501004156.

Angelsen, A. (2017) 'REDD+ as Result-based Aid: General Lessons and Bilateral Agreements of Norway', *Review of Development Economics*, 21(2), pp. 237–264. Available at: https://doi.org/10.1111/rode.12271.

APHI (2017) *Surat Edaran Nomor: SE.3/MenLHK-PHPL/SET/SET.1/7/2017 Tentang Pembatasan Kontrak Langsung Perdagangan Karbon*, *Asosiasi Pengusaha Hutan Indonesia*. Available at: https://www.rimbawan.com/regulasi/surat-edaran/surat-edaran-kementerian-lhk/tentang-pembatasan-kontrak-langsung-perdagangan-karbon/ (Accessed: 20 November 2024).

Barr, C. (2001) 'Banking on sustainability: structural adjustment and forestry reform in post-Suharto Indonesia'. Available at: https://hdl.handle.net/10568/18459 (Accessed: 21 December 2024).

Battocletti, V., Enriques, L. and Romano, A. (2023) 'The Voluntary Carbon Market: Market Failures and Policy Implications'. Rochester, NY: Social Science Research Network. Available at: https://doi.org/10.2139/ssrn.4380899.

Belis, D. and Kerremans, B. (2016) 'The socialization potential of the CDM in EU–Vietnam climate relations', *Climate Policy*, 16(8), pp. 1048–1064. Available at: https://doi.org/10.1080/14693062.2015.1064345.

Benecke, G. (2009) 'Varieties of Carbon Governance: Taking Stock of the Local Carbon Market in India', *The Journal of Environment & Development*, 18(4), pp. 346–370. Available at: https://doi.org/10.1177/1070496509347085.

Benessaiah, K. (2012) 'Carbon and livelihoods in Post-Kyoto: Assessing voluntary carbon markets', *Ecological Economics*, 77, pp. 1–6. Available at: https://doi.org/10.1016/j.ecolecon.2012.02.022.

Bernstein, S. (2001) *The Compromise of Liberal Environmentalism*. Columbia University Press. Available at: https://doi.org/10.7312/bern12036.

Bhullar, L. (2013) 'REDD+ and the Clean Development Mechanism: A comparative perspective', *International Journal of Rural Law and Policy*, (1), pp. 1–8. Available at: https://doi.org/10.5130/ijrlp.i1.2013.3229.

Biermann, F. *et al.* (2009) 'The Fragmentation of Global Governance Architectures: A Framework for Analysis', *Global Environmental Politics*, 9(4), pp. 14–40. Available at: https://doi.org/10.1162/glep.2009.9.4.14.

Boer, H.J. (2018) 'The role of government in operationalising markets for REDD + in Indonesia', *Forest Policy and Economics*, 86, pp. 4–12. Available at: https://doi.org/10.1016/j.forpol.2017.10.004.

BPDLH (2019) *Tentang Kami*, *BPDLH*. Available at: https://bpdlh.kemenkeu.go.id/about-us (Accessed: 24 November 2024).

Bui, Q.B., Do, T.N. and Nguyen, D.H. (2024) 'Establishing a Carbon Market in Vietnam', in A.T. Nguyen and L. Hens (eds) *Global Changes and Sustainable Development in Asian Emerging Market Economies: Volume 1*. Cham: Springer Nature Switzerland, pp. 421–435. Available at: https://doi.org/10.1007/978-3-031-68838-6_25.

Calel, R. (2013) 'Carbon markets: a historical overview', *WIREs Climate Change*, 4(2), pp. 107–119. Available at: https://doi.org/10.1002/wcc.208.

CDM: Methodologies (2024). Available at: https://cdm.unfccc.int/methodologies/index.html (Accessed: 23 December 2024).

CDM: Project Activities (2024). Available at: https://cdm.unfccc.int/Projects/projsearch.html (Accessed: 23 December 2024).

Chartier, A. and Tsayem Demaze, M. (2022) 'Hybridizations and reconfigurations in the roles of actors in voluntary carbon offsetting', *Local Environment*, 27(8), pp. 1007–1028. Available at: https://doi.org/10.1080/13549839.2022.2091530.

Chen, L. and Xie, M. (2023) 'How do hard regimes absorb, overlap, and squeeze out soft regimes? Insights from global carbon markets', *Global Public Policy and Governance*, 3(1), pp. 60–85. Available at: https://doi.org/10.1007/s43508-023-00064-3.

COP29 achieves full operationalisation of Article 6 of Paris Agreement - Unlocks International Carbon Markets (no date). Available at: https://cop29.az/en/media-hub/news/cop29-achieves-full-operationalisation-of-article-6-of-paris-agreement-unlocks-international-carbon-markets (Accessed: 27 December 2024).

Corbera, E., Estrada, M. and Brown, K. (2009) 'How do regulated and voluntary carbon-offset schemes compare?', *Journal of Integrative Environmental Sciences*, 6(1), pp. 25–50. Available at: https://doi.org/10.1080/15693430802703958.

Cortell, A.P. and Davis, J.W. (1996) 'How Do International Institutions Matter? The Domestic Impact of International Rules and Norms', *International Studies Quarterly*, 40(4), pp. 451–478. Available at: https://doi.org/10.2307/2600887.

Crowe, T.L. (2013) 'The potential of the CDM to deliver pro-poor benefits', *Climate Policy*, 13(1), pp. 58–79. Available at: https://doi.org/10.1080/14693062.2012.709080.

Dacin, M.T. (2002) 'Institutional Theory and Institutional Change: Introduction to the Special Research Forum', *Academy of Management* [Preprint]. Available at: https://www.jstor.org/stable/3069284.

Ecosystem Market Place and New Carbon Finance (2007) *State of the Voluntary Carbon Market 2007*. Ecosystem Marketplace. Available at: https://www.ecosystemmarketplace.com/wp-content/uploads/2017/06/2007-State-of-the-Voluntary-Carbon-Market-Report.pdf (Accessed: 3 December 2024).

Ecosystem Market Place and New Carbon Finance (2015) *State of the Voluntary Carbon Market 2015*. Ecosystem Marketplace. Available at: https://www.forest-trends.org/wp-content/uploads/2015/06/State-of-the-Voluntary-Carbon-Markets-2015.pdf (Accessed: 4 December 2024).

Finnemore, M. and Sikkink, K. (1998) 'International Norm Dynamics and Political Change', *International Organization*, 52(4), pp. 887–917. Available at: https://doi.org/10.1162/002081898550789.

Government of Indonesia (2004) *UNDANG-UNDANG REPUBLIK INDONESIA NOMOR 17 TAHUN 2004 TENTANG PENGESAHAN KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (PROTOKOL KYOTO ATAS KONVENSI KERANGKA KERJA PERSERIKATAN BANGSA-BANGSA TENTANG PERUBAHAN IKLIM)*. Available at: https://peraturan.bpk.go.id/Details/40514 (Accessed: 14 November 2024).

Government of Indonesia (2008) *PERATURAN PRESIDEN NOMOR 46 TAHUN 2008 TENTANG DEWAN NASIONAL PERUBAHAN IKLIM*.

Government of Indonesia (2011a) *INSTRUKSI PRESIDEN REPUBLIK INDONESIA NOMOR 10 TAHUN 2011 TENTANG PENUNDAAN PEMBERIAN IZIN BARU DAN PENYEMPURNAAN TATA KELOLA HUTAN ALAM PRIMER DAN LAHAN GAMBUT*. Available at: https://peraturan.bpk.go.id/Details/11355/inpres-no-10-tahun-2011 (Accessed: 14 November 2024).

Government of Indonesia (2011b) *Keputusan Presiden (Keppres) Nomor 25 Tahun 2011 tentang Satuan Tugas Persiapan Kelembagaan Reducing Emissions From Deforestation And Forest Degradation (REDD+)*. Available at: https://peraturan.bpk.go.id/Details/55064/keppres-no-25-tahun-2011 (Accessed: 3 December 2024).

Government of Indonesia (2011c) *Peraturan Presiden (Perpres) Nomor 61 Tahun 2011 tentang Rencana Aksi Nasional Penurunan Emisi Gas Rumah Kaca*. Available at: https://peraturan.bpk.go.id/Details/41199/perpres-no-61-tahun-2011 (Accessed: 24 November 2024).

Government of Indonesia (2011d) *Peraturan Presiden (Perpres) Nomor 71 Tahun 2011 tentang Penyelenggaraan Inventarisasi Gas Rumah Kaca Nasional*. Available at: https://peraturan.bpk.go.id/Details/41187/perpres-no-71-tahun-2011 (Accessed: 3 December 2024).

Government of Indonesia (2014) *Peraturan Pemerintah Republik Indonesia Nomor 12 Tahun 2014 tentang Jenis dan Tarif Atas Jenis Penerimaan Negara Bukan Pajak yang Berlaku Pada*

Kementerian Kehutanan. Available at: https://jdih.menlhk.go.id/new2/home/portfolioDetails/12/2014/7# (Accessed: 3 December 2024).

Government of Indonesia (2015) *Peraturan Presiden (Perpres) Nomor 16 Tahun 2015 tentang Kementerian Lingkungan Hidup Dan Kehutanan*. Available at: https://peraturan.bpk.go.id/Details/41738/perpres-no-16-tahun-2015 (Accessed: 26 December 2024).

Government of Indonesia (2016) *Undang-undang (UU) Nomor 16 Tahun 2016 tentang Pengesahan Paris Agreement To The United Nations Framework Convention On Climate Change (Persetujuan Paris Atas Konvensi Kerangka Kerja Perserikatan Bangsa-Bangsa mengenai Perubahan Iklim)*. Available at: https://peraturan.bpk.go.id/Details/37573 (Accessed: 22 November 2024).

Government of Indonesia (2017) *Peraturan Pemerintah (PP) Nomor 46 Tahun 2017 tentang Instrumen Ekonomi Lingkungan Hidup*. Available at: https://peraturan.bpk.go.id/Details/64701/pp-no-46-tahun-2017.

Government of Indonesia (2021) *PERATURAN PRESIDEN REPUBLIK INDONESIA NOMOR 98 TAHUN 2021 TENTANG PENYELENGGARAAN NILAI EKONOMI KARBON UNTUK PENCAPAIAN TARGET KONTRIBUSI YANG DITETAPKAN SECARA NASIONAL DAN PENGENDALIAN EMISI GAS RUMAH KACA DALAM PEMBANGUNAN NASIONAL*. Available at: https://peraturan.bpk.go.id/Details/187122/perpres-no-98-tahun-2021 (Accessed: 14 November 2024).

Granovetter, M. (1985) 'Economic Action and Social Structure: The Problem of Embeddedness', *American Journal of Sociology*, 91(3), pp. 481–510. Available at: https://www.jstor.org/stable/2780199.

Greenfield, P. (2023) *Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows*. Available at: https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe.

Gregorio, M.D. (2021) 'The politics of climate policy integration and land use in Indonesia', in *Governing Climate Change in Southeast Asia*. Routledge.

Guigon, P., Bellassen, V. and Ambrosi, P. (2009) *Voluntary Carbon Markets: What the Standards Say...* Research Report 2009–4. auto-saisine, p. 46 p. Available at: https://hal.science/hal-01149372 (Accessed: 4 December 2024).

Gupte, E. (2023) 'Verra makes major changes to methodology of forest-based carbon offsets', 20 April. Available at: https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/agriculture/042023-verra-makes-major-changes-to-methodology-of-forest-based-carbon-offsets.

Honkonen, T. (2009) 'The Principle of Common But Differentiated Responsibility in Post-2012 Climate Negotiations', *Review of European Community & International Environmental Law*, 18(3), pp. 257–267. Available at: https://doi.org/10.1111/j.1467-9388.2009.00648.x.

IDX (2023) *Launching of Indonesia Carbon Exchange (IDXCarbon)*, *PT Bursa Efek Indonesia*. Available at: https://www.idx.co.id/en/news/news/b882a251-3e5c-ee11-b808-005056aec3a4 (Accessed: 18 November 2024).

Indriatmoko, Y. *et al.* (2014) 'Rimba Raya biodiversity Reserve project, central kalimantan, Indonesia', *REDD+ on the ground: A case book of subnational initiatives across the globe*, pp. 348–361. Available at: https://www.jstor.org/stable/pdf/resrep02148.31.pdf (Accessed: 3 December 2024).

Jaspal, M. and Mukherjee, M. (2024) 'Charting Pathways for India's Carbon Market', *Observer Research Foundation* [Preprint].

Kamil, N., Bush, S.R. and Gupta, A. (2021) 'Does climate transparency enhance the reflexive capacity of state actors to improve mitigation performance? The case of Indonesia', *Earth System Governance*, 9, p. 100111. Available at: https://doi.org/10.1016/j.esg.2021.100111.

KEMENHUT (2008) *PERATURAN MENTERI KEHUTANAN Nomor : P. 68/Menhut-II/2008 TENTANG PENYELENGGARAAN DEMONSTRATION ACTIVITIES PENGURANGA*. Available at: https://jdih.menlhk.go.id/new2/home/portfolioDetails/68/2008/5 (Accessed: 14 November 2024).

KEMENHUT (2009a) *PERATURAN MENTERI KEHUTANAN REPUBLIK INDONESIA NOMOR : P. 36/Menhut-II/2009 TENTANG TATA CARA PERIZINAN USAHA PEMANFAATAN PENYERAPAN DAN/ATAU PENYIMPANAN KARBON PADA HUTAN PRODUKSI DAN HUTAN LINDUNG*. Available at: https://jdih.menlhk.go.id/new2/home/portfolioDetails/36/2009/5 (Accessed: 14 November 2024).

KEMENHUT (2009b) *PERATURAN MENTERI KEHUTANAN REPUBLIK INDONESIA Nomor : P.30/Menhut-II/2009 TENTANG TATA CARA PENGURANGAN EMISI DARI DEFORESTASI DAN DEGRADASI HUTAN (REDD)*. Available at: https://jdih.menlhk.go.id/new2/home/portfolioDetails/30/2009/5 (Accessed: 14 November 2024).

KEMENHUT (2012) *PERATURAN MENTERI KEHUTANAN Nomor: P. 20/Menhut-II/2012 REPUBLIK INDONESIA TENTANG PENYELENGGARAAN KARBON HUTAN*. Available at: https://jdih.menlhk.go.id/new2/home/portfolioDetails/20/2012/5 (Accessed: 14 November 2024).

Kemenko Perekonomian (2019) *LAPORAN PELAKSANAAN RENCANA AKSI NASIONAL PENURUNAN EMISI GAS RUMAH KACA YANG TERINTEGRASI TAHUN 2017*. Available at: https://deputi3.ekon.go.id/uploads/pustaka/Buku_Laporan_Pelaksanaan_RAN_GRK_20171.pdf (Accessed: 24 November 2024).

KEMENSEKNEG (2023) *Presiden Jokowi Luncurkan Bursa Karbon Indonesia*. Available at: https://setneg.go.id/baca/index/presiden_jokowi_luncurkan_bursa_karbon_indonesia (Accessed: 18 November 2024).

KESDM (2022) *Peraturan Menteri Energi dan Sumber Daya Mineral Nomor 16 Tahun 2022 tentang Tata Cara Penyelenggaraan Nilai Ekonomi Karbon Subsektor Pembangkit Tenaga Listrik*. Available at: https://peraturan.bpk.go.id/Details/257394/permen-esdm-no-16-tahun-2022 (Accessed: 27 December 2024).

KESDM (2024) *Transaksi Perdagangan Karbon Tahun 2023 Capai Rp84 miliar*. Available at: https://www.esdm.go.id/en/media-center/news-archives/transaksi-perdagangan-karbon-tahun-2023-capai-rp84-miliar (Accessed: 18 November 2024).

KLHK (2018) *Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.70/Menlhk/Setjen/Kum.1/12/2017 tentang Tata Cara PelaksanaanReducing Emissions From Deforestation And Forest Degradation, Role Of Conservation, Sustainable Management Of Forest And Enhancement*. Available at: https://jdih.menlhk.go.id/new2/home/portfolioDetails/70/2017/4 (Accessed: 26 December 2024).

KLHK (2019) *Pemerintah Luncurkan Badan Pengelola Dana Lingkungan Hidup*, *Pejabat pengelola Informasi dan Dokumentasi KLHK*. Available at: https://ppid.menlhk.go.id/berita/siaran-pers/5103/pemerintah-luncurkan-badan-.

KLHK (2022a) *MoEF Orders Validation of Forest Carbon Projects to Comply with Indonesian Laws and Regulations*, *Pejabat pengelola Informasi dan Dokumentasi KLHK*. Available at: https://ppid.menlhk.go.id/berita/siaran-pers/6501/moef-orders-validation-of-forest-carbon-projects-to-comply-with-indonesian-laws-and-regulations (Accessed: 20 November 2024).

KLHK (2022b) *Peraturan Menteri Lingkungan Hidup Dan Kehutanan Nomor 21 Tahun 2022 tentang Tata Laksana Penerapan Nilai Ekonomi Karbon*. Available at: https://peraturan.bpk.go.id/Details/235421/permen-lhk-no-21-tahun-2022 (Accessed: 19 November 2024).

KLHK (2024a) *Carbon Registry SPE*. Available at: https://srn.menlhk.go.id/spe.

KLHK (2024b) *Metodologi SRN PPI*, *SRN PPI*. Available at: https://srn.menlhk.go.id/index.php?r=metodologi%2Findex (Accessed: 19 November 2024).

KLHK (2024c) *Tindak Pelanggaran Perdagangan Karbon Hutan, Demi Jaga Tata Kelola yang Baik*, *Pejabat pengelola Informasi dan Dokumentasi KLHK*. Available at: https://ppid.menlhk.go.id/berita/siaran-pers/7645/tindak-pelanggaran-perdagangan- (Accessed: 20 November 2024).

Knox-Hayes, J. (2010) 'Creating the Carbon Market Institution: Analysis of the Organizations and Relationships That Build the Market', *Competition & Change*, 14(3–4), pp. 176–202. Available at: https://doi.org/10.1179/102452910X12587274068277.

Koh, H.H. (1996) 'Why Do Nations Obey International Law', *Yale Law Journal*, 106, p. 2599. Available at: https://heinonline.org/HOL/Page?handle=hein.journals/ylr106&id=2617&div=&collection=.

Kreibich, N. and Hermwille, L. (2021) 'Caught in between: credibility and feasibility of the voluntary carbon market post-2020', *Climate Policy*, 21(7), pp. 939–957. Available at: https://doi.org/10.1080/14693062.2021.1948384.

Lang, S., Blum, M. and Leipold, S. (2019) 'What future for the voluntary carbon offset market after Paris? An explorative study based on the Discursive Agency Approach', *Climate Policy*, 19(4), pp. 414–426. Available at: https://doi.org/10.1080/14693062.2018.1556152.

Larson, D.F., Dinar, A. and Frisbie, A.J. (2011) *Agriculture and the clean development mechanism*. The World Bank (Policy Research Working Papers). Available at: https://doi.org/10.1596/1813-9450-5621.

Lewis-Beck, M., Bryman, A. and Futing Liao, T. (2004) *The SAGE Encyclopedia of Social Science Research Methods*. 2455 Teller Road, Thousand Oaks California 91320 United States of America: Sage Publications, Inc. Available at: https://doi.org/10.4135/9781412950589.

Lo, A.Y. and Cong, R. (2017) 'After CDM: Domestic carbon offsetting in China', *Journal of Cleaner Production*, 141, pp. 1391–1399. Available at: https://doi.org/10.1016/j.jclepro.2016.09.220.

Lovell, H.C. (2010) 'Governing the carbon offset market', *WIREs Climate Change*, 1(3), pp. 353–362. Available at: https://doi.org/10.1002/wcc.43.

McDermott, C.L. (2014) 'REDDuced: From sustainability to legality to units of carbon—The search for common interests in international forest governance', *Environmental Science & Policy*, 35, pp. 12–19. Available at: https://doi.org/10.1016/j.envsci.2012.08.012.

McNeill, D. (2015) 'Norway and REDD+ in Indonesia: The Art of Not Governing?', *Forum for Development Studies*, 42(1), pp. 113–132. Available at: https://doi.org/10.1080/08039410.2014.997791.

Mensah, J. (2019) 'Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review', *Cogent Social Sciences*. Edited by S. Ricart Casadevall, 5(1), p. 1653531. Available at: https://doi.org/10.1080/23311886.2019.1653531.

Merger, E. and Pistorius, T. (2011) 'Effectiveness and legitimacy of forest carbon standards in the OTC voluntary carbon market', *Carbon Balance and Management*, 6(1), p. 4. Available at: https://doi.org/10.1186/1750-0680-6-4.

Methmann, C. (2013) 'The sky is the limit: Global warming as global governmentality', *European Journal of International Relations*, 19(1), pp. 69–91. Available at: https://doi.org/10.1177/1354066111415300.

Michaelowa, A., Shishlov, I. and Brescia, D. (2019) 'Evolution of international carbon markets: lessons for the Paris Agreement', *WIREs Climate Change*, 10(6), p. e613. Available at: https://doi.org/10.1002/wcc.613.

Miles, W.B. (2021) 'The invisible commodity: Local experiences with forest carbon offsetting in Indonesia', *Environment and Planning E: Nature and Space*, 4(2), pp. 499–524. Available at: https://doi.org/10.1177/2514848620905235.

Moeliono, M. *et al.* (2020) 'REDD+ in Indonesia: A new mode of governance or just another project?', *Forest Policy and Economics*, 121, p. 102316. Available at: https://doi.org/10.1016/j.forpol.2020.102316.

Mol, A.P.J. (2012) 'Carbon flows, financial markets and climate change mitigation', *Environmental Development*, 1(1), pp. 10–24. Available at: https://doi.org/10.1016/j.envdev.2011.12.003.

Müller, B. and Michaelowa, A. (2019) 'How to operationalize accounting under Article 6 market mechanisms of the Paris Agreement', *Climate Policy*, 19(7), pp. 812–819. Available at: https://doi.org/10.1080/14693062.2019.1599803.

Newell, P. and Paterson, M. (2010) *Climate Capitalism: Global Warming and the Transformation of the Global Economy*. USA: Cambridge University Press.

Newell, R.G., Pizer, W.A. and Raimi, D. (2013) 'Carbon Markets 15 Years after Kyoto: Lessons Learned, New Challenges', *Journal of Economic Perspectives*, 27(1), pp. 123–146. Available at: https://doi.org/10.1257/jep.27.1.123.

Nofyanza, S. and Dwisatrio, B. (2023) *Towards Indonesian carbon market: Input from REDD+ projects*. Center for International Forestry Research (CIFOR). Available at: https://doi.org/10.17528/cifor-icraf/008867.

North, D.C. (1991) 'Institutions', *The Journal of Economic Perspectives*, 5(1), pp. 97–112. Available at: https://www.jstor.org/stable/1942704 (Accessed: 11 December 2024).

OJK (2023) *PERATURAN OTORITAS JASA KEUANGAN REPUBLIK INDONESIA NOMOR 14 TAHUN 2023 TENTANG PERDAGANGAN KARBON MELALUI BURSA KARBON*. Available at: https://ojk.go.id/id/regulasi/Pages/Perdagangan-Karbon-Melalui-Bursa-Karbon.aspx (Accessed: 18 November 2024).

Paterson, M. (2012) 'Who and what are carbon markets for? Politics and the development of climate policy', *Climate Policy*, 12(1), pp. 82–97. Available at: https://doi.org/10.1080/14693062.2011.579259.

Polanyi, K. (2001) *The Great Transformation: The Political and Economic Origins of Our Time*. Beacon Press.

Putri, C.A. (2022) 'Pajak Karbon Batal Berlaku 1 Juli, Sri Mulyani Buka Suara', *CNBC Indonesia*, 27 June. Available at: https://www.cnbcindonesia.com/news/20220627174616-4-350788/pajak-karbon-batal-berlaku-1-juli-sri-mulyani-buka-suara (Accessed: 12 November 2024).

Qi, Y. *et al.* (2008) 'Translating a Global Issue Into Local Priority: China's Local Government Response to Climate Change', *The Journal of Environment & Development*, 17(4), pp. 379–400. Available at: https://doi.org/10.1177/1070496508326123.

Ranson, M. and Stavins, R.N. (2016) 'Linkage of greenhouse gas emissions trading systems: learning from experience', *Climate Policy*, 16(3), pp. 284–300. Available at: https://doi.org/10.1080/14693062.2014.997658.

Riedy, C. and Atherton, A. (2008) *Carbon Offset Watch 2008 Assessment Report*. The Institute for Sustainable Futures.

Riehl, B. *et al.* (2017) 'Lessons Learned in Mandatory Carbon Market Development', *International Review of Environmental and Resource Economics*, 10(3–4), pp. 227–268. Available at: https://doi.org/10.1561/101.00000087.

Schroeder, M. (2009) 'Varieties of Carbon Governance: Utilizing the Clean Development Mechanism for Chinese Priorities', *The Journal of Environment & Development*, 18(4), pp. 371–394. Available at: https://doi.org/10.1177/1070496509347083.

Sharma, S. and Desgain, D. (2013) 'Understanding the concept of nationally appropriate mitigation action'. Available at: https://www.osti.gov/etdeweb/biblio/22134652 (Accessed: 3 December 2024).

Shrivastava, M.K. and Bhaduri, S. (2019) ‘Market-based mechanism and “climate justice”: reframing the debate for a way forward’, *International Environmental Agreements: Politics, Law and Economics*, 19(4), pp. 497–513. Available at: https://doi.org/10.1007/s10784-019-09448-5.

Smits, M. (2017) ‘The New (Fragmented) Geography of Carbon Market Mechanisms: Governance Challenges from Thailand and Vietnam’, *Global Environmental Politics*, 17(3), pp. 69–90. Available at: https://doi.org/10.1162/GLEP_a_00416.

Stone, C.D. (2004) ‘Common but Differentiated Responsibilities in International Law’, *American Journal of International Law*, 98(2), pp. 276–301. Available at: https://heinonline.org/HOL/P?h=hein.journals/ajil98&i=286 (Accessed: 23 December 2024).

Sugiyama, T. and Sinton, J. (2005) ‘Orchestra of Treaties: A Future Climate Regime Scenario with Multiple Treaties among Like-minded Countries’, *International Environmental Agreements: Politics, Law and Economics*, 5(1), pp. 65–88. Available at: https://doi.org/10.1007/s10784-004-3702-6.

TEMPO (2024) ‘Perusahaan Konservasi Memenangkan Gugatan atas Pencabutan Izin KLHK’, 16 July. Available at: https://www.tempo.co/lingkungan/menang-di-ptun-rimba-raya-menunggu-pembatalan-pencabutan-izin-klhk-39434 (Accessed: 20 November 2024).

Tuerk, A. *et al.* (2009) ‘Linking carbon markets: concepts, case studies and pathways’, *Climate Policy*, 9(4), pp. 341–357. Available at: https://doi.org/10.3763/cpol.2009.0621.

UNDP (2024) *Partnership for Market Readiness (PMR)*, *UNDP Transparency Portal*. Available at: https://open.undp.org/projects/00097002 (Accessed: 22 November 2024).

UNFCCC (2005) *KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE*. Available at: https://unfccc.int/documents/2409 (Accessed: 14 November 2024).

UNFCCC (2008) *Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007*. Available at: https://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf (Accessed: 3 December 2024).

UNFCCC (2016) *PARIS AGREEMENT*. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf (Accessed: 19 November 2024).

UNFCCC (2018) *The Katowice climate package: Making The Paris Agreement Work For All Related information*, *UNFCCC*. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/katowice-climate-package.

UNFCCC (no date) *CDM: Executive Board (EB)*. Available at: https://cdm.unfccc.int/EB/index.html (Accessed: 2 December 2024).

Varvasovszky, Z. (2000) ‘A stakeholder analysis’, *Health Policy and Planning*, 15(3), pp. 338–345. Available at: https://doi.org/10.1093/heapol/15.3.338.

Verra Database (2024). Available at: https://registry.verra.org/app/search/VCS (Accessed: 5 January 2025).

Wallerstein, I. (2011) *The Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. 1st edn. University of California Press. Available at: https://www.jstor.org/stable/10.1525/j.ctt1pnrj9 (Accessed: 15 December 2024).

Zeng, Y., Faure, M.G. and Feng, S. (2024) 'Localization vs globalization of carbon emissions trading system (ETS) rules: how will China's national ETS rules evolve?', *Climate Policy*, pp. 1–15. Available at: https://doi.org/10.1080/14693062.2024.2427724.