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Navigating

Institutional barriers and Enablers in Governing Decarbonisation of Maritime Transport in Thailand

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MSc Thesis Environmental Policy
ENP80436

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Abstract

Maritime transportation in Thailand faces governance challenges in aligning its national climate commitments with the International Maritime Organisation's (IMO) ambitious decarbonisation targets. This disconnect creates policy ambiguity and institutional friction, hindering effective climate action in the maritime sector. This thesis aims to explore this governance gap by identifying the institutional attributes that function as barriers and enablers to the decarbonisation of Thailand's maritime transport. Employing a qualitative methodology, the study combines the policy arrangement concept with the PERMAGOV institutional attribute framework, and a diagnostic tool developed within the European Union. Data was gathered through document analysis and semi-structured interviews with key public and private sector stakeholders. The findings reveal that institutional attributes are not static but become barriers or enablers within a policy arrangement concept under stress from new climate demands. Key institutional barriers identified include unclear actor roles and responsibilities between maritime and climate agencies, institutional rigidity that slows adaptation to international rules, and a lack of institutionalised incentives to foster private sector investment. Conversely, the significant institutional enablers could be the development and use of knowledge to overcome a pronounced expertise deficit, enhanced actor connectivity to improve inter-agency collaboration, and robust actor accountability to ensure compliance.

Keywords: policy arrangement
institutional barrier
institutional enabler
maritime decarbonisation
maritime governance in Thailand

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List of Abbreviations

BAU	Business-as-Usual
CBDR	Principle Of Common but Differentiated Responsibilities
CO_2	Carbon Dioxide
DCCE	Department Of Climate Change and Energy
ESG	Environmental, Social, And Governance Principles
EU	European Union
GHG	Greenhouse Gases
IAD	Institutional Analysis and Development
IMO	International Maritime Organization
LT-LEDS	Long-Term Low Greenhouse Gas Emission Development Strategy
MARPOL Annex VI	The International Convention for Preventing Air Pollution from Ships
MD	Marine Department
MRV	Monitoring, Reporting, And Verification
NDCs	Nationally Determined Contributions
OECD	The Organisation for Economic Co-Operation and Development
OTP	Office of Transport and Traffic Policy and Planning
PA	Policy Arrangement Concept
PAT	Port Authority of Thailand
PERMAGOV	A Project in Improving Performance of the European Union (EU) Marine Governance
PSHEMS	Port Safety, Health and Environmental Management System
PSL	Precious Shipping Public Company Limited
SDGs	The Sustainable Development Goals
TGO	Thailand Greenhouse Gas Management Organization
TSA	Thai Shipowners' Association
UNCLOS	The United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	The United Nations Framework Convention on Climate Change

Use of AI

During the writing of this Thesis, no generative AI language models were used to create ready-made content. The core ideas, research, and contributions are entirely the author's own work. However, specific AI tools were utilised to support the writing and research process in the translation and writing assistance. As this thesis studies the Thai context and includes interviews conducted in the Thai language, Google Translate and Gemini AI were used to assist with the translation of source materials. ChatGPT was used as a writing assistant to provide feedback on the logical flow and structure of the writing. It was also used for grammar checking and to offer suggestions for improving the academic tone and clarity of the writing.

Chapter 1
Introduction

1.1 Background

Global Climate Commitments and the Maritime Transport

International shipping contributes about 2–3% of global greenhouse gas (GHG) emissions (IMO, 2021). Yet, unlike other sectors, international shipping occupies a special position in global climate governance. The Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) sets overarching global targets to limit warming to well below 2°C and calls for countries to submit Nationally Determined Contributions (NDCs) (UNFCCC, 2015). However, the Paris Agreement does not explicitly cover international shipping, leaving this high-emission sector outside the national accounting framework.

Instead, emissions from international shipping fall under the regulatory authority of the International Maritime Organisation (IMO). In 2018, the IMO adopted its Initial Strategy on Reduction of GHG Emissions from Ships, updated in 2023, which aims for net-zero emissions "by or around 2050". The updated strategy also introduced interim checkpoints: reducing GHG emissions by 20–30% by 2030 and by 70–80% by 2040 compared to 2008 levels (IMO, 2023).

This creates a global governance disconnect. While the Paris Agreement governs climate action broadly, the IMO sets sector-specific rules for international shipping. The two frameworks operate in parallel but are not formally integrated, leading to fragmentation in ambition, timelines, and accountability. This disconnection poses significant challenges for countries, which must both meet their Paris-driven national targets and comply with IMO regulations such as those for flag, port, and coastal states.

Thailand's Climate Policy and Maritime Transport

Thailand has aligned its climate action with the Paris Agreement through its NDCs, the Climate Change Master Plan (2015–2050) (ONEP, 2022a), and the revised Long-Term Low GHG Emission Development Strategy (LT-LEDS). In 2016, Thailand set a target to reduce national GHG emissions by 20–25% from business-as-usual levels by 2030, aligning with the Paris Agreement (ONEP, 2022a). In 2021, Thailand also announced a vision for carbon neutrality by 2050 and net-zero emissions by 2065 (ONEP, 2022a). These commitments focus primarily on domestic emissions in sectors such as energy, industry, agriculture, and transport, consistent with the Paris Agreement framework.

Thailand's exports of goods and services were reported as 65.45% of GDP in 2023 (World Bank, 2025a), with over 83% of imports and exports relying on shipping (Krungsri Research, 2024). Thailand's major ports are managed by the Port Authority of Thailand, such as Leam Chabang Port, Bangkok Port and Chiang Saen Port. Since 2009, Laem Chabang has recorded an average annual growth of 7%, and by 2015, it achieved a market share of 6.58% in container throughput among Southeast Asian ports (OECD, 2020). Regarding the increasing of climate change and geopolitical tensions, concerns about food security are intensifying (Krungsri Research, 2024). This leads to a surge in the global demand for food products, which is considering Thailand's position as a significant provider of agricultural products to global market and the strategic

importance of Southeast Asian Sea routes in connecting Southeast Asia to other countries around the world (Krungsri Research, 2024).

Despite this, the sector is not fully integrated into national climate policies. The National GHG Reduction Action Plan for Domestic Transport (2021–2030) includes domestic shipping along with road, rail, and aviation (OTP, 2019). However, international shipping is excluded from Thailand's NDCs and climate strategies, even though Thailand, as an IMO member, is bound by the IMO's decarbonisation targets. This reflects a national–sectoral disconnect: Thailand's domestic climate policies are shaped by Paris Agreement obligations but do not account for the IMO's international shipping targets. Thus, Thailand illustrates the broader governance challenge by integrating the global disconnect between Paris and IMO frameworks into coherent national climate and maritime policies.

At the same time, institutional fragmentation complicates coordination. The Department of Climate Change and Environment (DCCE) is responsible for overall climate policy, the Office of Transport and Traffic Policy and Planning (OTP) oversees domestic transport, and the Marine Department (MD) governs maritime affairs. These overlapping mandates make it difficult to align Thailand's Paris-driven national commitments with IMO-driven international shipping obligations (OCS, 2024; OTP, 2019). Climate actions, domestic transport policies, and maritime affairs may fall under separate departments, leading to potential conflicts, gaps, and inefficiencies in the governing of decarbonisation shipping in Thailand.

Identifying Institutional Barriers and Enablers

Effective maritime governance, which involves the ability of diverse stakeholders, including governmental entities, maritime industry, and civil society organisations, to regulate activities and their effects on the marine ecosystem (van Tatenhove, 2013), is essential for implementing decarbonisation policies. However, improving maritime governance is challenging; for example, networks of actors responsible for policy development and implementation within a specific domain, such as maritime transport, evolve over time and become embedded in routines. These are part of the collaboration tendencies that might impede adaptation and the efficient implementation of sustainability initiatives (van Leeuwen et al., 2024).

Institutional barriers, defined as structural impediments within governance frameworks systematically hindering policy effectiveness and adaptability, are critical to identifying meaningful governance reforms, policy coherence, and implementation efficiency (Fobé et al., 2024). By identifying barriers, such as issues of fragmentation, knowledge, participation, etc., policymakers can more systematically identify what type of institutional change is needed (Nielsen et al., 2023).

Recently, a project in improving performance of the European Union (EU) marine governance or PERMAGOV project, funded by Horizon Europe programme of the European Commission and UKRI, aims to bring marine governance within the EU to more in line with the goals of the European Green Deal. The PERMAGOV project explicitly addresses marine governance institutional barriers through its newly developed diagnostic tool. This tool systematically identifies barriers (e.g., fragmentation, knowledge gaps, actor control) to strategically guide policymakers toward effective governance improvements (Nielsen et al., 2023). For example, if a governance failure is diagnosed primarily as an issue of "Scale of Institutions" or mismatch

between institutional scale and the ecological problem, or "Actor Control" or inadequate distribution of decision-making power, then reforms can target those areas (Nielsen et al., 2023).

The PERMAGOV's diagnostic tool has primarily focused on the EU context (Nielsen et al., 2023). While the diagnostic tool provides an approach to identifying institutional barriers in marine governance and analysing governance challenges, its methodological application is still in the initial phase, necessitating further theoretical and methodological refinement for broader applicability (Flannery et al., 2024). The next step in developing the diagnostic tool might require further theoretical development to enhance its application. Moreover, literature emphasises the importance of adapting governance tools to diverse institutional contexts while accounting for political, cultural, and economic variables (Oberlack, 2017; Ostrom, 2005; van Leeuwen et al., 2024). Therefore, exploring institutional dynamics within differing governance contexts like Thailand will offer opportunities to refine the tool's robustness and diagnostic precision.

Thailand, a developing country in Southeast Asia, and the EU differ significantly in their political, cultural, and economic settings. Politically, Thailand operates as a constitutional monarchy with a history of military coups and political instability (Russell, 2020), whereas the EU is a supranational union of democratic states emphasising rule of law and human rights (EU, n.d.-b). Culturally, Thailand's society is deeply influenced by Buddhism, social hierarchy, and a relatively homogenous national identity (Sattayanurak, 2019), while the EU is marked by linguistic, religious, and cultural diversity with a strong emphasis on individual freedoms (EU, n.d.-a). Economically, Thailand is a developing nation focused on manufacturing, agriculture, and tourism (World Bank, 2024), whereas the EU has a highly integrated and advanced economy driven by innovation and a strong service sector (EC, n.d.). These differences raise the interest in testing the adaptability of the PERMAGOV diagnostic tool in a Thai setting, which may provide insights into the institutional attributes that function as barriers and enablers to decarbonisation in Thailand's maritime governance.

1.2 Problem Description

The IMO regulates international shipping GHG emissions through the IMO GHG Strategy, which targets net-zero emissions by 2050. Thailand, as an IMO member, must comply with these regulations and pursue its national climate commitments under the Paris Agreement, which targets net-zero emissions by 2065. However, Thailand's national climate policies primarily focus on domestic GHG emissions, including domestic shipping, and exclude international shipping from its climate action strategies. This policy disconnectedness creates challenges in aligning Thailand's national decarbonising policies with international maritime decarbonisation obligations.

Additionally, the key Thai government agencies in decarbonisation policies in maritime transport, such as the DCCE, OTP, and MD, hold overlapping or unclear mandates regarding maritime decarbonisation. This weak coordination creates inefficiencies and makes it difficult to align Thailand's Paris-driven national commitments with IMO-driven shipping obligations. As a result, Thailand's maritime transport sector faces the risk of falling behind both global frameworks: not fully contributing to its Paris Agreement pledges and not adequately preparing to meet IMO's shipping decarbonisation targets.

To address these challenges, this thesis will explore the policy arrangement concept to examine how governance structures shape the decarbonisation of Thailand's maritime transport sector and apply PERMAGOV's diagnostic tool to identify institutional attributes that function as barriers and enablers in governing the decarbonisation of maritime transport in Thailand.

1.3 Research Objective

The objective of this thesis is to apply the PERMAGOV diagnostic tool and the policy arrangement concept to examine how governance structures shape the decarbonisation of Thailand's maritime transport sector. This study contributes to three main goals:

1. To explore the maritime governance of Thailand through the policy arrangement concept by analysing how actors, rules, resources, and discourses interact in shaping decarbonisation policies. This provides a structured understanding of the governance dynamics in Thailand's maritime sector.
2. To identify institutional attributes that function as barriers and enablers in governing maritime decarbonisation, with attention to the disconnects between Paris, IMO, and national frameworks, as well as between domestic and international shipping.
3. To refine the methodological application of the PERMAGOV diagnostic tool beyond the EU setting by testing it in the Thai context, not only identifying institutional barriers (Flannery et al., 2024) but also recognising enablers that may facilitate turning policies into action.

Through this combined approach, the thesis strengthens both theory and practice by enhancing the robustness of the diagnostic tool, advancing the application of the policy arrangement framework in a non-EU setting, and offering actionable insights for maritime governance in Thailand.

1.4 Research Questions

Main research question: How do institutional attributes function as barriers and enablers in governing decarbonisation of maritime transport in Thailand?

Sub-research questions:

1. How does the policy arrangement concept (actors, rules, resources, and discourses) shape maritime decarbonisation governance in Thailand?
2. Which institutional attributes function as barriers to implementing decarbonisation policies in Thailand's maritime transport sector?
3. Which institutional attributes function as enablers that facilitate the implementation of decarbonisation policies in Thailand's maritime transport sector?
4. How are the identified institutional barriers and enablers interconnected, and what implications does this have for improving maritime governance in Thailand?

1.5 Thesis Outline

This thesis consists of eight chapters, structured as follows:

- Chapter 1 introduces the research, outlines the problem, states the objectives, and presents the research questions.
- Chapter 2 provides a theoretical foundation, reviewing the policy arrangement concept, institutional attributes, and the conceptual framework on institutional barriers and enablers.
- Chapter 3 describes the methodology, detailing the research design, data collection through document analysis and interviews, researcher positionality, and the application of PERMAGOV's diagnostic tool.
- Chapter 4 analyses policy arrangements concerning international and national decarbonisation policies within Thailand's maritime sector.
- Chapter 5 identifies institutional attributes relevant to maritime governance in Thailand and examines how these attributes act as barriers and enablers, including their interconnectedness.
- Chapter 6 discusses the findings, evaluates the diagnostic tool's strengths and weaknesses, and addresses limitations.
- Chapter 7 concludes the thesis, responds directly to the main research question, reflects on the diagnostic tool's effectiveness, and provides recommendations for future studies and implications and policy recommendations.

Chapter 2
Theoretical Framework

This thesis draws on interrelated theoretical frameworks to analyse the governance of maritime decarbonisation in Thailand: policy arrangements, institutional attributes, institutional barriers and enablers. Together, these frameworks provide a structured way to understand how governance systems shape climate action in the maritime sector. The policy arrangement concept offers a lens to examine how actors, rules, resources, and discourses interact and evolve within a policy domain, revealing the broader governance dynamics in which maritime decarbonisation is situated. Institutional attributes then focus more closely on the maritime governance actors, rules, and interactions. Building on this, the concepts of institutional barriers and institutional enablers allow us to identify how these attributes either constrain or facilitate effective climate policy implementation. The PERMAGOV diagnostic tool serves as the main analytical instrument, providing a systematic way to identify institutional barriers and enablers across these frameworks and apply them to the Thai maritime context.

2.1 Policy Arrangements

The policy arrangement concept refers to "the temporary stabilisation of the content and organisation of a particular policy domain" (Van Tatenhove et al., 2000, p. 54 as cited in Liefferink, 2006). It is understood as part of ongoing processes of institutionalisation, where interactions among policy actors solidify into stable patterns that simultaneously shape and are shaped by subsequent behaviours (Liefferink, 2006).

The framework of policy arrangements identifies four interrelated dimensions that structure policy arrangements (Liefferink, 2006), represented by a tetrahedron model (see Figure 1), which captures four interrelated dimensions:

1. *Actors and Coalitions*: Entities involved in policy processes, their roles, and alliances.
2. *Resources and Power*: Distribution and mobilisation of resources influencing actors' capacities and their ability to determine outcomes.
3. *Rules of the Game*: Formal and informal rules and norms governing interaction, decision-making, and implementation.
4. *Discourses*: Prevailing narratives, views, norms, values, and definitions shaping the substance of policy debates and programmes.

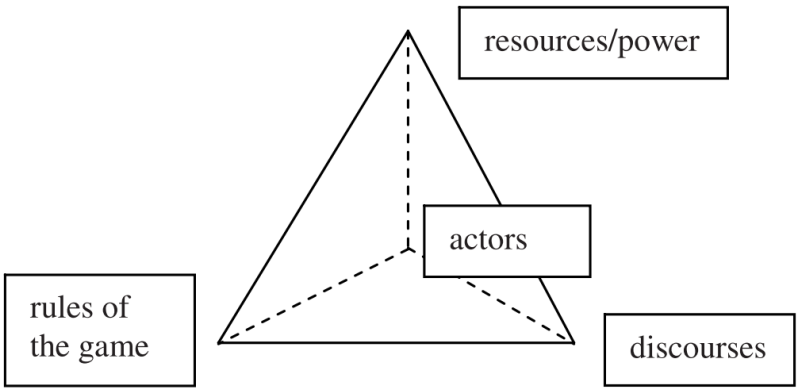

Figure 1 *The tetrahedron-shaped model represents the interdependence of the four dimensions of a policy framework (Liefferink, 2006).*

The dynamic of policy arrangements

The dynamics of a policy arrangement are understood through the constant, interwoven interaction of its four key dimensions: actors and coalitions, resources and power, rules of the game, and policy discourses (Liefferink, 2006). Change and stability within a policy domain arise from this interplay (Arts et al., 2006). The tetrahedron visualise this indissoluble relationship, where a change in one dimension is likely to induce a chain reaction, affecting one or more of the others (Arts et al., 2006). The dynamics can be analysed from four different analytical perspectives, depending on the research question. Each perspective uses one of the four dimensions as a starting point into the tetrahedron to understand how changes unfold (Liefferink, 2006). For example, change is often initiated by the appearance of new actors, a shift in the composition of existing coalitions, or the formation of new alliances, which new actors can bring in different resources, introduce new discourses, and alter power relationships, thereby energising a static situation (Arts et al., 2006). In addition to this, the dynamics are driven by adding or withdrawing resources (e.g., skills, knowledge, subsidies), which can attract or exclude actors and instigate new coalitions (Liefferink, 2006). Policy interventions like subsidies or taxes are designed to create change through this resource/power dimension, and actors use resources as weapons to influence outcomes or as prizes to improve their own position (Liefferink, 2006). Moreover, power is not just relational between actors but also regulatory, based on rules and discourses, which is the ability to shape narratives (Liefferink, 2006). In essence, the policy arrangements evolve through ongoing interactions between strategic actions of daily policy implementation and broader structural processes termed political modernisation, characterised by changes in governance and the interrelations between state, market, and civil society (Arts et al., 2006). Thereby, adopting the policy arrangement framework facilitates an understanding of how policy domains maintain structural stability while adapting to dynamic shifts, driven by strategic and structural forces at multiple governance levels (Arts et al., 2006).

Adopting the policy arrangement concept therefore allows this thesis to capture the overall dynamics of governance, showing where challenges arise and where interventions or policy adjustments may be necessary. However, to unpack these dynamics more precisely, it is necessary to examine the specific institutional attributes that underpin them.

2.2 Institutional Attributes

While policy arrangements highlight the broader governance dynamics, understanding why certain arrangements succeed or fail requires a closer look at the rules, norms, and procedures that structure interactions among actors. These are captured by the concept of institutional attributes.

Institutions can be described as "rule-based social patterns that structure social interactions and exert a broad and lasting influence on society", which broadly defines institutions as formal (i.e., codified laws, policies, and regulations) or informal (i.e., customs, cultural norms, routines), and both types play a role in governance outcomes (van Koppen & SPArgaren, 2023).

Ostrom (2005) developed the Institutional Analysis and Development (IAD) framework to help social science researchers analyse the institutional processes that lead to individual and collective decisions. The IAD framework (see Figure 2) emphasises the framework concepts as "action arena", which includes "participants" and "action situations." Participants are impacted by "exogenous variables", making actions under "action arena", and interacting with actions and outcomes. Both exogenous variables and action arena interactions produce results that are judged by the "participants" (Ostrom, 2005).

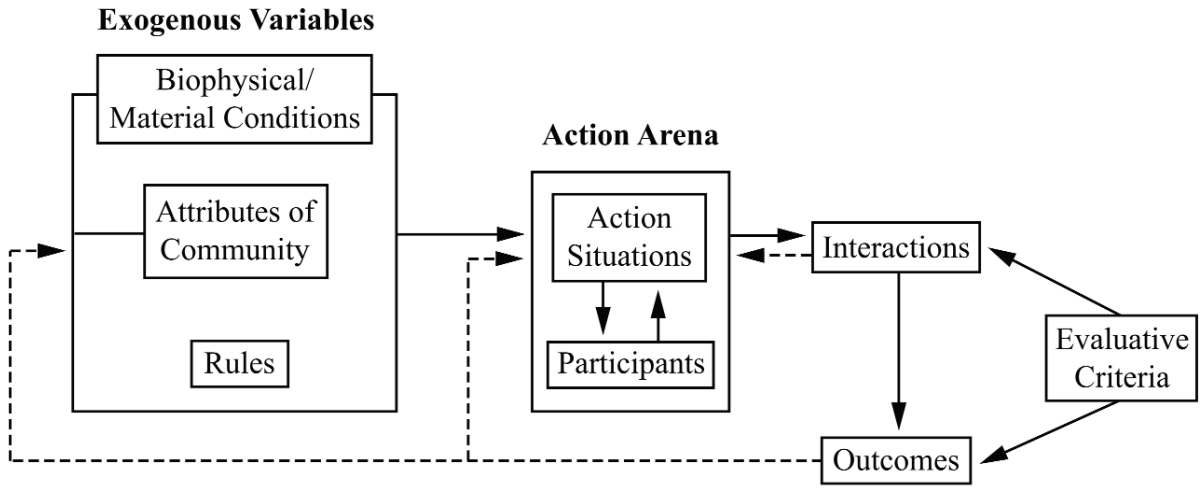

Figure 2 *Institutional Analysis and Development (IAD) framework components (Ostrom, 2005)*

This sort of evaluation has an impact on other framework components, for example, boundary rules defining who can participate, choice rules assigning actors' responsibilities, and aggregation rules determining how decisions are made, all of which structure how governance "action situations" unfold (Oberlack, 2017). In essence, these institutional attributes determine who is involved, what actions are allowed or required, and how collective decisions are made, and the configurations of these rules strongly influence collective action outcomes in resource governance (Ostrom, 2005). For instance, clear boundary rules and well-specified choice rules are associated with more effective management of common resources, whereas unclear or conflicting rules can lead to coordination failures (Oberlack, 2017).

Building on the IAD by Ostrom (2005), the study by Oberlack (2017) developed institutional attributes as the specific characteristics or dimensions of institutions, including rules, norms, and procedures, that shape how individuals and organisations interact and make decisions, particularly in the context of climate change adaptation and policy implementation.

Oberlack (2017) categorised institutional factors into 10 attributes under 3 dimensions: agency, social interaction, and inherent institutional attributes, providing a framework for analysing barriers to climate adaptation (see Figure 3).

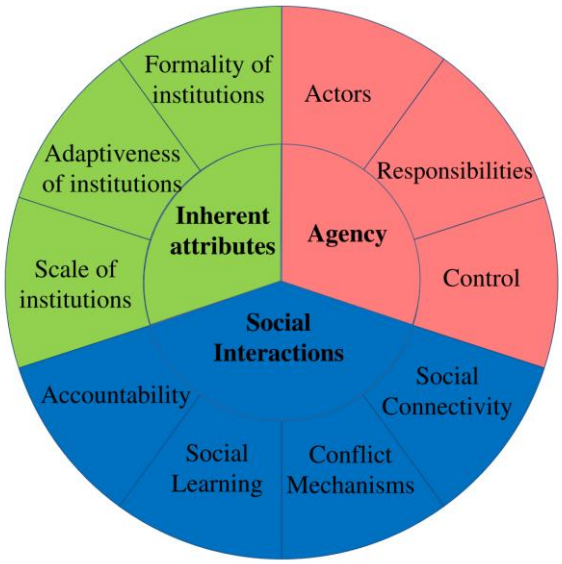

Figure 3 *Taxonomy of institutional attributes in climate adaptation (Oberlack, 2017)*

- *Agency* attributes show how rules and procedures influence individual decision-making in adaptation situations, which are broken down into:
  - (A) Actor eligibility: the qualities of boundary rules that determine who may engage in an adaptation situation.
  - (B) Responsibilities: position and choice rules controlling participant positions and actions.
  - (C) Control: Aggregation rules regulating participant control over adaptation outcomes.
- *Social interaction* attributes define actor-linking techniques and networks that are decomposed into:
  - (D) Social connectivity: institutionalised processes (chains of actions, events, and consequences) and networks (connections between numerous positions and players) that connect actors across social organisation tiers.
  - (E) Conflict mechanisms: resolving, transforming, or preventing conflicts
  - (F) Social learning: constructing, communicating, and accepting information, values, and preferences among participants
  - (G) Accountability mechanisms: monitoring, evaluating, rewarding, and enforcing responsibilities
- *Inherent attributes* of institutions consist of:
  - (H) Scale of institutions: geographical and temporal boundaries
  - (I) Adaptiveness of institutions: limit of higher-order rules, route dependency, and transaction costs on rule-in-use change
  - (J) Formality of institutions: the extent to which regulations are codified in laws, plans, or papers.

Understanding these barriers is key to fostering institutional reforms that support sustainable development and effective policymaking.

Diagnosing Institutional Attributes

The PERMAGOV project further examined these challenges across four marine policy areas, consisting of marine energy, maritime transport, marine plastics, and marine life, which highlight how institutional rules can obstruct or facilitate solutions (Nielsen et al., 2023). Expanding on Oberlack's framework, PERMAGOV emphasises the structural and procedural impediments inherent in governance frameworks through the systematic scoping review of peer-reviewed studies that looked at institutional barriers in the EU marine policy contexts and produced a list of 11 institutional attributes (see Table 1) (Nielsen et al., 2023). This review found common governance issues such as fragmentation, scale mismatches, knowledge production and use, and rigid or inflexible institutions. Building on Oberlack (2017) framework of 10 institutional attributes, Nielsen et al. (2023) adjusted the attribute of Social Learning into a broader category called *Development and Use of Knowledge*, capturing how information and values are constructed, communicated, and applied in governance. In addition, they introduced an 11th attribute, *Institutionalised Incentives*, to capture barriers arising from misaligned or missing incentives that discourage actors from engaging in governance. Together, these adjustments extended Oberlack's typology to the EU marine policy context and informed the development of the PERMAGOV diagnostic tool.

Table 1 A list of institutional attributes and description of barriers that pertain to institutional attributes (Flannery et al., 2024)

No.	Institutional Attribute	Description of barriers pertaining to institutional attributes
(1)	Actor eligibility	Lack of (appropriate) boundary rules that regulate the set of eligible actors in action situations.
(2)	Actor roles and responsibilities	Inappropriate rules that regulate the positions available to participants and the set of required, prohibited and allowed actions assigned to positions.
(3)	Actor control (power distribution)	Lack of (appropriate) rules that establish the kind of control actors have over outcomes of action situations.
(4)	Actor accountability	Inappropriate institutional provisions for monitoring, evaluating, rewarding, and enforcing responsibilities.
(5)	Actor connectivity	Inappropriate structures that connect actors within and across multiple tiers of social organisation.
(6)	Conflict mechanisms	Lack of (appropriate) institutional provisions for regulating, preventing or resolving conflicting values, preferences and actions among actors.
(7)	Development and use of knowledge	Inappropriate institutional attributes that shape how information, knowledge claims and values are constructed, communicated, accepted, and used.
(8)	Scale of institutions	Inappropriate spatial and temporal implications of institutions.
(9)	Rigidity of institutions	Change in the rules-in-use is inappropriately constrained by higher-order rules, transaction costs and path dependence.
(10)	Formality of institutions	Inappropriate degree to which rules-in-use are embedded in written laws, plans, documents.
(11)	Institutionalised incentives	Inappropriate provision for institutionalised incentives for actors.

2.3 Institutional Barriers and Enablers

Institutional barriers are defined as "impasses in governance processes rooted in the institutional context" (Oberlack, 2017). These happen when formal or informal rules and structures systematically hinder effective action or policy implementation. These barriers include unclear responsibilities, fragmented governance, insufficient accountability, and institutional mismatches with the scale of a problem.

Institutional enablers refer to structural and procedural factors that facilitate effective decision-making, policy implementation, and institutional change within governance systems (Fobé et al., 2024). According to a policy report on Institutional Barriers and Enablers - Blue Green Governance Project, (Fobé et al., 2024) categorised institutional enablers into three broad types: adaptive governance, policy integration, and stakeholder collaboration. These enablers promote coherence, flexibility, and innovation, allowing institutions to adapt to new challenges and improve governance effectiveness.

Initially, the PERMAGOV's diagnostic tool, developed by Flannery et al. (2024), was actively used to engage stakeholders in identifying and prioritising institutional barriers to marine governance. Participants were provided with three key tools: barrier cards, an Impact/Priority matrix, and a Barrier Interaction matrix. First, the barrier cards presented participants with detailed descriptions of institutional barriers, their characteristics, and governance challenges, along with real-world examples tailored to the four marine policy areas of the PERMAGOV project. Next, participants placed these barriers onto the *Impact/Priority Matrix*, ranking them based on their perceived influence on policy implementation and urgency for action. This process helped identify the three most critical barriers within each regime complex. Finally, participants explored how these high-impact barriers interconnected with other governance challenges using the *Barrier Interaction Matrix*. This allowed them to deliberate on whether resolving high-priority barriers could also mitigate additional barriers, which enables a more strategic approach to policy intervention. Additionally, participants contributed to refining the diagnostic tool by providing insights from their sector-specific perspectives and experiences from the workshop. This interactive process enabled stakeholders to compare their findings with those from PERMAGOV's systematic literature review, ensuring that both academic and practitioner perspectives were considered. This tool ultimately helped policymakers, researchers, and stakeholders identify and categorise institutional barriers in real-world contexts that focus on attributes such as actor eligibility, institutional scale, and accountability mechanisms (Flannery et al., 2024).

Despite the PERMAGOV diagnostic tool being designed to identify the institutional attributes as barriers, these institutional attributes could also be used to identify enablers to facilitate marine policy implementation.

2.4 Conceptual Framework

Bringing these theoretical frameworks together, this thesis develops a conceptual framework that integrates policy arrangements, institutional attributes, and their roles as barriers or enablers. This conceptual framework allows for a diagnosis of governance challenges in Thailand's maritime sector, where the disconnects between global (Paris vs IMO) and national (domestic vs international shipping) frameworks create complex institutional dynamics. By applying the PERMAGOV diagnostic tool, the framework identifies both barriers that undermine policy effectiveness and enablers that could strengthen maritime governance.

The diagram below (see Figure 4) presents the thesis structure, integrating four interrelated components: Policy Arrangements, Institutional Attributes, Institutional Barriers, and Institutional Enablers.

- *Policy arrangements* establish the overall dynamics where governance challenges arise.
- *Institutional attributes* serve as the building blocks that define the operational context against which barriers and enablers are assessed.
    - *Institutional barriers* represent the impediments that occur when both formal and informal attributes fail to meet the demands of effective policy implementation. These barriers are the critical pain points that the framework will diagnose and subsequently target with strategic interventions.
    - *Institutional enablers* are the factors that facilitate effective policy implementation and institutional change. These enablers provide a counterbalance to the identified barriers, highlighting opportunities for reform, innovation, and improved governance outcomes.

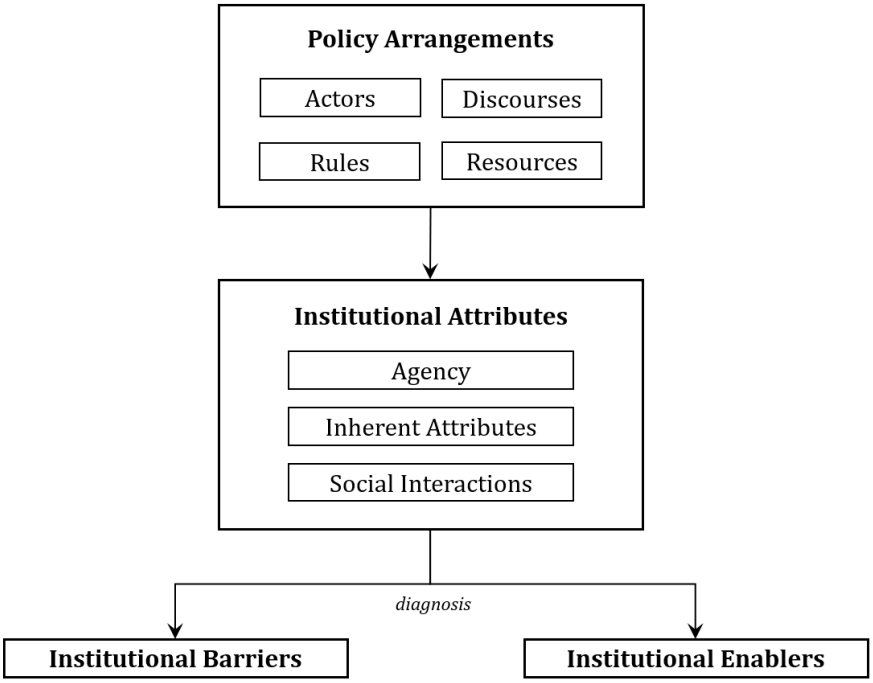

Figure 4 *The Conceptual Framework*

Chapter 3
Methodology

The methodology utilised throughout this thesis is based on the principles of a deductive analysis, also known as a priori analysis, which is a research approach where existing theories or frameworks are applied to data to test or refine them. This thesis is a "top-down" method, starting with a predefined set of categories or codes based on theory and then applying them to the data. This approach is often used to confirm or refute existing theories or to build upon previous work (ATLAS.ti, n.d.).

3.1 Study Design

This thesis was designed as a qualitative case study of Thailand, focusing on how institutional arrangements shape the governance of maritime decarbonisation. A case study approach was appropriate because it enabled in-depth investigation of governance processes, institutional dynamics, and the disconnects between global frameworks, such as Paris and IMO, and Thailand's national climate policies.

The study centred on key actors involved in the decision-making, formulation, and implementation of decarbonisation policies within Thailand's maritime and national climate governance systems. Data collection and analysis covered the period up to July 2025, providing a snapshot of institutional challenges and opportunities during an important phase of global and national climate policy development.

3.2 Data Collection

Two main methods of data collection were employed: document analysis and expert interviews.

3.2.1 Document Analysis

Relevant official documents were reviewed, including legislation, policies, strategic plans, and reports related to climate change, maritime transport governance, and decarbonisation, both national and international levels. Only publicly available and non-confidential documents were used in the study.

3.2.2 Expert Interviews

The expert interview is a qualitative research method for gathering in-depth insights and knowledge from individuals possessing specialised expertise (GLG, n.d.). In academic discourse, an expert is characterised as an individual possessing specific knowledge who holds a certain status or exercises a function within decision-making processes in a particular field of action (Libakova & Sertakova, 2015). These individuals are distinguished by their "specialised expertise and authority" (Döringer, 2021) and their "privileged access to the knowledge of specific groups of people or decision-making processes" (Libakova & Sertakova, 2015). Unlike an ordinary person, an expert is considered a "carrier of deep knowledge of the research object" (Döringer, 2021). Their high level of competence contributes significantly to the reliability of the information they provide (GLG, n.d.).

Semi-structured interviews were used, guided by questions on maritime decarbonisation, governance arrangements, and institutional barriers/enablers. Interviews lasted between 60 and 90 minutes and were conducted online via Microsoft Teams. Consent for participation and recording was obtained in advance via email and reconfirmed at the beginning of each session. All interviews were conducted in Thai, recorded, and transcribed automatically by Microsoft Teams. The Thai transcripts were analysed in English, and the analysis was also translated into English by the researchers.

Participants

A total of 10 expert interviews were conducted, which included the following participants (see Table 2), covering representatives from both the maritime and non-maritime sectors involved in decarbonisation policy processes. The experts have been involved in the decision-making process or the formulation and implementation of decarbonisation policies in maritime transport sectors or national climate action.

Table 2 *List of Participants in the Expert Interviews*

No.	Group	Type of Participant	Organisation
Maritime Sector			
1*	Public Sector	Government agency	Environment Division, Marine Department (MD)
2*	Public Sector	Government agency	International Affairs Division, Marine Department (MD)
3*	Public Sector	Government agency	Planning Bureau, Marine Department (MD)
4*	Public Sector	Government agency	Maritime Promotion Division, Marine Department (MD)
5	Public Sector	Government agency	Anonymous
6*	Public Sector	State-Owned Enterprises	Port Authority of Thailand (PAT)
7	Private Sector	Shipowner	Thai Shipowners' Association (TSA)
8	Private Sector	Shipowner	Precious Shipping Public Company Limited (PSL)
Non-Maritime Sector			
9	Public Sector	Government agency	Department of Climate Change and Environment (DCCE)
10	Public Sector	Public Organisation	Thailand Greenhouse Gas Management Organisation (TGO)

* Five interviews also incorporated the PERMAGOV Diagnostic Tool through an online Miro platform (https://miro.com/), which engaged participants in identifying and prioritising institutional barriers and enablers.

Interview Structure

The interviews aimed to explore the policy arrangement and identify institutional barriers and supporting factors affecting maritime decarbonisation governance. Additionally, the research utilised the PERMAGOV diagnostic tool to deeply analyse institutional attributes impacting policy implementation.

The interviews consisted of two main parts:

- Part 1: General interview questions on agency roles, responsibilities, policy arrangements, discourses, and perceptions of barriers and enablers.
- Part 2: Application of the PERMAGOV diagnostic tool, where participants selected and ranked key institutional barriers and enablers, discussed their interconnections, and reflected on strategies for improvement.

While all 10 interviews covered Part 1; however, only 5 interviews completed Part 2, applying the PERMAGOV diagnostic tool due to limited time and participant availability.

3.3 Data Analysis

In qualitative research, coding encompasses procedures that facilitate the organisation, categorisation, and thematic arrangement of gathered data, offering a structured framework for interpreting significance (Williams & Moser, 2019). This thesis examined these documents and interviews using deductive coding strategies to organise the analysis of various source types into the main theme.

Data analysis was conducted using deductive coding, which was employed to create prior main themes based on the research questions and theoretical framework (Bingham, 2023). Codes were derived from the theoretical framework of this thesis, including policy arrangements, institutional attributes, and their functions as barriers or enablers, and applied systematically to the interview transcripts and documents. After initially deductive coding, this thesis also looked over the open codes; however, the deductive coding already covered all the main themes of the analysis.

This thesis applied thematic analysis using ATLAS.ti software to systematically organize and interpret qualitative data gathered from semi-structured interviews and relevant documents. Thematic analysis involves identifying, analysing, and reporting patterns or themes within data (ATLAS.ti, n.d.), which can provide a structured method to capture key insights related to institutional barriers and enablers in maritime transport governance. ATLAS.ti facilitates this analytical process through advanced coding, visualisation, and thematic mapping functionalities, enabling efficient categorisation and in-depth exploration of textual data (ATLAS.ti, n.d.). Interview transcripts and relevant documents were uploaded into ATLAS.ti, systematically coded according to the four dimensions of policy arrangement and the eleven institutional attributes derived from the PERMAGOV framework (see Table 3), and then interpreted to determine the functions of the attributes as barriers or enablers regarding the document analysis and interview results. Additionally, institutional barriers and enablers were identified both directly through participant responses, especially in the five PERMAGOV tool applications, and indirectly through researcher interpretation of interview content in line with the PERMAGOV framework.

Table 3 *Coding lists in ATLAS.ti*

Code Group	Code
Policy Arrangement	Actor
	Discourse
	Resource/Power
	Rule of the game
Institutional attribute	Actor accountability
	Actor connectivity
	Actor eligibility
	Actor roles and responsibilities
	Conflict mechanisms
	Development and use of knowledge
	Formality of institutions
	Institutionalised incentives
	Power distribution
	Rigidity of institutions
	Scale of institutions
Attribute Function	Barrier
	Enabler

Additionally, Thai communication practices often rely on indirect and high-context expressions. For example, instead of rejecting a proposal directly, responses may be framed as "difficult" or "we'll see." In such cases, paraphrasing was required to interpret implied meanings while preserving the intent of participants. This process supported accurate translation and analysis.

3.4 Positionality

Since 2021, I have been employed as a government officer at the Marine Department, Ministry of Transport, Thailand, which is responsible for developing, promoting, and regulating the country's maritime transport sector. This professional role provided me with insider knowledge of institutional processes, policy formulation, and regulatory challenges within the maritime domain. As a Thai researcher, I brought cultural familiarity and contextual understanding that enhanced both the conduct of interviews and the interpretation of data. Being fluent in Thai allowed me to engage participants in their native language, capture nuances in meaning, and accurately interpret indirect communication styles typical in Thai cultural settings. This positionality also helped establish rapport with participants, particularly government officials and industry stakeholders, who might have been less open with an external researcher.

At the same time, I remained critically aware of my position within the Marine Department. While this provided access and understanding, it also required reflexivity to avoid bias in data interpretation. I took steps to ensure objectivity by systematically applying the theoretical frameworks and combining interview findings with document analysis. This dual positionality, both as an insider in Thai maritime governance and as an academic researcher, supported a more nuanced and grounded analysis of the institutional barriers and enablers shaping Thailand's maritime decarbonisation efforts.

Chapter 4
Policy Arrangement Concept of Decarbonisation in Thailand's Maritime Transport

The governance of maritime transport in Thailand is undergoing a fundamental and turbulent transformation. A policy arrangement once defined by a stable, insular focus on maritime safety, trade facilitation, and national economic growth is being destabilised by the urgent, cross-cutting demands of global and national climate policy. This chapter analyses this evolving policy arrangement, examining the dynamic interplay between actors, rules, resources/power, and discourses that collectively shape the governance landscape for maritime decarbonisation of Thailand. The analysis draws on document analysis and expert interviews to understand how these dimensions integrate and evolve in response to the growing pressure for decarbonisation.

4.1 Actors

The group of actors involved in governing maritime decarbonisation has expanded and fragmented, shifting from a relatively simple hierarchy led by the Marine Department (MD) to a complex network of agencies with overlapping mandates and ambiguous lines of authority. This structural evolution, driven primarily by the establishment of the Department of Climate Change and Environment (DCCE), has created both new institutional capacity for climate action and significant coordination challenges.

Changes in the Main Actors

At the heart of the traditional arrangement are the established maritime authorities. The ***Marine Department (MD)***, under the Ministry of Transport, serves as the government agency for the maritime sector, acting as Thailand's flag and port state administrator. Its mandate has centred on registering ships, enforcing safety and conventional pollution standards (e.g., oil and garbage), and conducting port state control inspections (MD, 2024). Within the MD, divisions such as the Environment Division and the International Affairs Division are responsible for ensuring compliance with marine environmental rules and coordinating with international bodies like the International Maritime Organisation (IMO), which is the key global regulator for shipping emissions. Thailand, as an IMO member, participates in IMO's Marine Environment Protection Committee, where strategies to cut GHGs are negotiated. The United Nations Convention on the Law of the Sea (UNCLOS) also underpins Thailand's obligations, as Part XII of UNCLOS commits parties to prevent marine pollution, including from ships. Thailand ratified UNCLOS in 2011 and uses it to support marine environmental protection measures (Kongrawd, 2022). Its mandate centres on safety, conventional pollution standards, and IMO compliance.

In addition, the ***Port Authority of Thailand (PAT)***, a state-owned enterprise also under the Ministry of Transport, manages the country's major ports, including Laem Chabang and Bangkok Port, and influences emissions reductions through port operations. As the primary operator of port infrastructure, its decisions regarding technology, energy provision, and operational efficiency are critical to reducing emissions within port boundaries (ATO, 2024).

Meanwhile, the governance landscape has been reshaped by the entry of actors with broader, cross-sectoral mandates. The ***Office of Transport and Traffic Policy and Planning (OTP)***, another government agency within the Ministry of Transport, functions as the national focal point for the transport sector's overall strategy and GHG data monitoring (Jitrpatima, 2022). While OTP plays a crucial role in planning and data collection in domestic transportation for Thailand's NDCs, its power is circumscribed to existing projects, regarding the National GHG Reduction Action Plan (2021–2030) for the domestic transportation sector, which lacks the direct authority to mandate new projects or policies, meaning the ultimate decision rests with the individual agencies. This structural weakness limits its ability to drive cohesive action across the transport sub-sectors.

The most significant structural change has been the establishment of the ***Department of Climate Change and Environment (DCCE)*** in 2023 under the Ministry of Natural Resources and Environment. The DCCE acts as Thailand's national coordinating authority for all climate policy, serving as the focal point for the United Nations Framework Convention on Climate Change (UNFCCC) and leading the drafting of national climate legislation. Its mandate is to formulate national climate plans, monitor progress, and drive implementation across all economic sectors, including transport. The creation of the DCCE centralises high-level climate policymaking and reporting, backed by the authority of the National Climate Change Policy Committee, which is chaired by the Prime Minister (DCCE, n.d.).

In essence, cross-sectoral agencies like the OTP and the newly established DCCE have brought climate policy into maritime governance. However, the DCCE, despite centralising national climate policy, lacks sectoral enforcement tools and maritime-specific expertise. This situation has led to coordination issues and ambiguous roles between DCCE, OTP, and MD.

Private Sector and Other Supporting Actors

The private sector also plays a critical and multifaceted role. Larger, globally integrated shipowners such as ***Precious Shipping Public Company Limited (PSL)*** are adjusted to international market pressures, investor expectations, and IMO regulations. PSL, as one of the largest shipowners in Thailand, has actively engaged in sustainability transitions, advocating for carbon pricing mechanisms and integrating ESG (Environmental, Social, and Governance) principles into its operations. Conversely, smaller and more domestically focused operators often lack the financial flexibility and international exposure that enable such proactive approaches. These operators tend to prioritise cost minimisation and regulatory certainty, making them more vulnerable to policy shifts.

The ***Thai Shipowners' Association (TSA)*** represents a broad spectrum of domestic shipping interests and often articulates the concerns of operators who feel burdened by high compliance costs and limited support. The TSA plays a key intermediary role in communicating industry perspectives to regulators but also faces internal challenges in aligning diverse member interests.

Supporting actors include the ***Thailand Greenhouse Gas Management Organisation (TGO)***, a public organisation under the Ministry of Natural Resources and Environment. TGO is responsible for overseeing national GHG emissions accounting, MRV (monitoring, reporting, and verification) systems, and carbon credit schemes. While not a regulatory body, TGO's technical expertise and infrastructure are crucial for enabling both public and private stakeholders to engage with emerging climate policy tools such as emissions trading and carbon markets.

Together with various international agencies and academic institutions, they can also offer technical aid and knowledge support, with the potential for further involvement in marine transport in the near future.

4.2 Rules

The regulatory framework guiding Thailand's maritime decarbonisation is shaped by a disconnect between international and national systems. A comparative look at the greenhouse gas (GHG) reduction ambitions of the international maritime sector and the nation of Thailand reveals distinct timelines and targets, reflecting their unique jurisdictions and capabilities (see Table 4).

Table 4 *A comparative look at the greenhouse gas (GHG) reduction ambitions of the international maritime sector and the nation of Thailand.*

	2023 IMO GHG Strategy	**Thailand's Nationally Determined Contribution (NDC)**
Primary Scope	International Shipping Industry	Entire national economy of Thailand *(including the domestic shipping industry)*
Baseline Year	2008	Business-as-Usual (BAU) projection
Target Year		
2030	***GHG Emissions Reduction***: At least a 20% reduction, striving for 30%, in total annual GHG emissions compared to 2008 levels. ***Carbon Intensity Reduction***: At least a 40% reduction in CO_2 emissions per transport work compared to 2008. ***Zero/Near-Zero Emission Fuel Uptake:*** At least 5%, striving for 10% of the energy used by international shipping to be from zero- or near-zero GHG emission technologies, fuels, and/or energy sources.	***GHG Emissions Reduction:*** 30% reduction from the projected business-as-usual (BAU) level. This target can be increased to 40% with sufficient international support in terms of finance, technology, and capacity building.
2040	At least a 70% reduction, striving for 80%, in total annual GHG emissions compared to 2008 levels.	
2050	By or around 2050: Reach net-zero GHG emissions	Achieve carbon neutrality, meaning a balance between the amount of greenhouse gases produced and the amount removed from the atmosphere.
2065		Achieve net-zero GHG emissions

The IMO's strategy is sector-specific, focusing on the emissions from international shipping. It sets absolute reduction targets based on a historical baseline year (2008) and includes specific goals for improving carbon intensity and adopting alternative fuels (IMO, 2023). In contrast, Thailand's NDC covers all sectors of its economy. Its primary target is relative to a BAU scenario, which projects future emissions without new climate policies. This means the absolute level of emissions in 2030 will depend on the BAU projection. Thailand also distinguishes between unconditional and conditional targets, with the contingent on receiving international assistance (ONEP, 2022b). Furthermore, the timelines for achieving net-zero emissions differ, with the IMO aiming for around 2050 and Thailand targeting 2065 (IMO, 2023; ONEP, 2022b). This reflects the different challenges and opportunities for decarbonisation within a global industry versus a national economy with diverse sectors.

The IMO's 2023 GHG Strategy provides binding international obligations, but domestic translation into Thai law has been slow-moving, incomplete, and lagging behind global standards. This gap between international obligations and national enforcement capacity creates regulatory uncertainty for all parties and undermines the country's ability to implement effective decarbonisation policies.

Drivers for the rule changes in maritime transport

The primary driver for change in the rules of the game in maritime transport is the ***2023 IMO Strategy on Reduction of GHG Emissions from Ships***, which has set ambitious targets, aiming for net-zero GHG emissions from international shipping "by or around, i.e., close to, 2050," with interim checkpoints to reduce emissions by at least 20% (striving for 30%) by 2030 and by at least 70% (striving for 80%) by 2040, compared to 2008 levels. This strategy is given legal force through the international convention for preventing air pollution from ships or ***MARPOL Annex VI***. Key technical and operational measures under MARPOL Annex VI require improvements in energy efficiency and rate the operational carbon intensity of vessels. As an IMO member state, Thailand is obligated to implement these regulations for its flagged fleet and enforce them on foreign vessels visiting its ports (MD, 2022).

Despite these clear international obligations, their translation into Thai domestic law has been delayed. Thailand only recently committed to MARPOL Annex VI, and domestic GHG regulation in shipping remains underdeveloped. As late as 2019, legal analyses noted that Thailand was among a number of countries that had not yet acceded to the convention, meaning the IMO's global 0.5% sulphur fuel cap, which came into force in 2020, was not automatically enforceable in its waters (Holness, 2019). This prolonged delay, likely due to concerns about compliance costs for the domestic fleet and the availability of low-sulphur fuel, highlights the system's institutional rigidity. It was only in 2021 in Thailand's Overall Maritime Strategy that the government made the accession of MARPOL Annex VI an explicit policy target, showing a formal commitment to align with international standards (MD, 2022).

The emerging of the national climate regulations

Thailand is now taking significant steps to close this regulatory gap through two key pieces of legislation. The upcoming ***Climate Change Act*** represents the most potential shift in the domestic rules. The second draft of the Climate Change Act, released for public consultation in late 2024, aims to establish a comprehensive legal basis for national climate policy, with implementation

expected in 2026 (Tilleke & Gibbins, 2025). Key provisions of the Climate Change Act that will directly impact the maritime sector include:

- A mandatory Emissions Trading System (ETS), which will set emissions caps for designated industries.
- A carbon tax on fossil fuels, with maximum rates specified for oil, gas, and coal.
- A Thailand Carbon Border Adjustment Mechanism (CBAM), modelled on the EU's system, to place a carbon price on certain imported goods.
- The establishment of a Climate Change Fund to support green investment and adaptation projects.

If the Climate Change Act is enacted, this law will transform the regulatory landscape from one based on voluntary measures and international compliance to one of mandatory domestic obligations, potentially covering fuels used in domestic shipping.

Complementing this is the draft ***Clean Air Act***, which progressed through parliament in 2024 and 2025. While its primary focus is on criteria air pollutants like PM2.5 rather than GHGs, its provisions have significant co-benefits for decarbonisation. This act establishes the public's right to clean air, creates mechanisms for designating pollution control zones, and sets up a "Clean Air and Health Fund" financed through a "polluter pays" principle (Hunton, 2025). For the maritime sector, these provisions could empower regulators to enforce stricter standards on marine fuels and port emissions, particularly in urban areas like Bangkok and Laem Chabang.

However, their enactment is slow, and industry faces regulatory uncertainty, caught between binding international rules and still-developing national frameworks. Consequently, the slow pace of formal legislation has created a debate among stakeholders about the role of informal rules, such as voluntary programmes, have emerged to fill this gap. Some stakeholders see them as precursors to formal law, while others question their effectiveness due to a lack of legal enforcement.

One interviewee argued for a legislative approach:

> *"Legislation starts with informal like soft rules because drafting laws in Thailand takes a long time (5-10 years), which may not be timely."*

International rules from the IMO are clear but apply directly only to international shipping, while the domestic enforcement is weak. Domestic rules, like the Climate Change Act, are potentially powerful but are not yet enacted, and their final form, scope, and timeline remain uncertain. This system of rules creates a strategic dilemma for private actors, leading to a "wait-and-see" deformation that is a response to regulatory uncertainty. Because investing in green technology is a long-term, high-cost decision, making such a commitment is extremely risky when it is unclear which standards will prevail, which technologies will be compliant, and whether any government support will be available.

From the industry side, PSL's representative stated in an interview:

> *"We currently comply with both national and international measures, which increases costs and uncertainties. But in the long term, we see it as an opportunity for new technologies and innovation."*

The business strategy, as articulated by industry representatives, is therefore to delay major investments until the rules are clear and stable. This regulatory gap is not just a legal issue; it is a primary economic barrier to private sector action.

4.3 Resources / Power

Power in maritime decarbonisation governance depends on access to knowledge, technical expertise, financial resources, and political capital. While financial constraints remain a significant and frequently cited barrier, the analysis reveals a critical shift in the policy arrangement: specialised knowledge has surpassed financial capital as the most foundational resource.

Knowledge and Data

Over the past decade, the shipping industry has faced pressure to decarbonise, digitise, and enhance operational efficiency. Despite significant technological progress in areas such as automation, alternative fuels, and digital platforms, substantial gaps remain, hindering global shipping's transformation into a fully "smart and green" sector (Tijan et al., 2021; World Bank, 2020). The maritime sector's digital transformation is also hampered by fragmentation of information systems. Many ports, terminals, shipping lines, and customs authorities operate in silos with proprietary data formats, leading to duplication of effort and delays (Brunila et al., 2021).

Additionally, shipping's decarbonisation is central to meeting global climate goals, yet it remains one of the most challenging to reduce greenhouse gas emission. For example, the shipping industry is exploring a range of low- and zero-carbon fuels, each with distinct advantages and challenges. Liquefied natural gas offers immediate CO_2 reductions but is undermined by methane slip, a potent greenhouse gas (Kuittinen et al., 2023). Ammonia and hydrogen hold long-term potential as zero-carbon fuels, though they face safety, storage, and infrastructure barriers (Lerh, 2024). Methanol appears more commercially viable in the near term due to easier handling, but its climate benefits depend on scaling up green production pathways. These gaps are not only technical but also intertwined with regulatory, institutional, and human capacity constraints.

Across interviews with government officials, the lack of knowledge and data was identified as the most critical resource gap. Interviewees referred to knowledge and data as foundational resources but also highlighted financial and political constraints.

An interviewee provided a clear ranking of important resources:

> *"Data as the most critical resource… then executive vision, politics, and finally funding."*

This prioritisation underscores the belief that effective decision-making is impossible without a solid evidence base.

This sentiment was echoed by another respondent, who argued:

> *"The primary problem for the public sector is a lack of knowledge and understanding, particularly in science and technology."*

This deficiency renders agencies unable to effectively utilise external advice, as another respondent of the public sector in maritime transport added:

> "*Even with external consultants, issues remain unresolved because public sector executives and agencies lack the foundational knowledge to truly comprehend or effectively utilise the information provided.*"

This knowledge deficit is not merely a capacity issue, but it is a source of institutional vulnerability that shapes Thailand's position in the global maritime governance system. Decarbonisation is a highly technical field involving complex fuel technologies, energy efficiency metrics, and market-based mechanisms. Without sufficient internal expertise, government agencies cannot independently evaluate policy options, critique proposals from the IMO or industry, or design effective, context-specific regulations. Consequently, they are forced into a reactive position of being rule-takers rather than rule-shapers. They must adopt standards and models developed elsewhere without the capacity to fully adapt them to the Thai context. This dynamic helps explain the slow and often incomplete translation of international rules into domestic policy.

Financial Constraints

Financial resources remain a critical and tangible constraint to technological adoption and decarbonisation in the shipping industry. Many shipowners, especially small and medium-sized operators, face difficulties securing the significant capital required for improving vessels, adopting alternative fuels, or investing in digital infrastructure (Poulsen & Johnson, 2016). High upfront costs, uncertain returns, and the lack of uniform global regulations discourage private investment, while limited access to green financing further delays transitions (UNCTAD, 2021).

The analysis revealed that a shortage of budget is a primary concern for both ports and shipping companies. This limitation means Thai shipowners tend to be followers rather than the first movers in this transition.

From the port operations perspective, a representative from the PAT observed:

> *"Limited budgets and manpower slow down environmental initiatives, even when there is willingness to comply with green port initiatives."*

Private sector representatives stressed the importance of financial support, as indicated by a shipowner in an interview:

> *"The high cost of new technologies and alternative fuels, coupled with uncertain returns on investment, makes shipowners hesitant to move beyond existing practices… Without financial support, we can't risk investing in alternative fuels with uncertain returns."*

This financial burden often results in a wait-and-see approach, where companies postpone innovation until regulatory frameworks and market incentives become clearer.

Political Will and Centralised Control

The governance of maritime transport, the sector responsible for carrying a large volume of global trade, is a highly political exercise. The world's oceans are awash in politics, where any significant change to governance disrupts existing power structures and the allocation of resources (Bennett, 2019). Modern port governance is defined by the tension between safeguarding the public interest and leveraging the efficiency of private enterprise (Notteboom et al., 2021). This dynamic is influenced by a host of external forces. International bodies like the IMO set binding global standards, while institutions such as the United Nations Conference on Trade and Development

(UNCTAD) and the World Bank guide national policy through analysis and reform advocacy (UNCTAD, 2024; World Bank, 2025b). Furthermore, geopolitical conflicts and climate change expose the fragility of critical chokepoints like the Suez and Panama Canals, creating intense political pressure on governments to invest in resilience and diversify trade routes (Business Money, 2024). National policies on trade, such as tariffs, can directly alter shipping patterns, underscoring the sector's sensitivity to political decisions (MKTALT, n.d.).

This political context informs a debate in port management: the choice between centralised and decentralised control. A centralised structure offers standardisation and control over core objectives, while a decentralised one allows for greater flexibility and faster reaction to customer demands (Brooks, 2004). A study by Zheng & Negenborn (2014) found that a decentralised port regulation mode was associated with higher efficiency, greater demand, and higher overall social welfare. The study also found, however, that the impact of either model on total port capacity and operator profit was uncertain, suggesting a strategic trade-off (Zheng & Negenborn, 2014).

Currently, Thailand's maritime governance architecture reflects the centralised approach that built the Laem Chabang project, which was the centrepiece of the government's Eastern Seaboard Development Plan, a top-down strategy to decentralise industry and create a new economic engine for the nation by creating national competitiveness and a powerful political imperative for the development of a modern deep-sea port (ATO, 2024). The PAT, a state-owned agency under the Ministry of Transport, owns and manages the nation's key port assets, making the critical long-term investment and expansion decisions. This centralised strategic control is explicitly codified in documents like Thailand's Overall Maritime Strategy, which translates national ambitions into a concrete action plan with clear targets for meeting international safety and environmental standards (MD, 2022). However, Thailand has designed a hybrid model that emphasises practicality, where strategic control is centralised but operational management is decentralised.

Thus, the development and management of ports and shipping lanes are not merely logistical challenges but are direct reflections of a nation's strategic priorities, economic ambitions, and capacity for political will. This political power appears to be a key resource in shaping maritime decarbonisation policies, as the maritime governance system continues to rely on the government's strategic priorities.

An interviewee highlighted:

> *"Directives from superiors or those in power do influence operations, and vision and policy from high-level politics can significantly accelerate implementation, especially with top-down support and the negotiation of budgets for crucial projects."*

Another interviewee argued:

> *"Since the private sector plays a vital role in implementation, therefore, they should also be involved in designing policies to ensure they are practical and effective."*

This sentiment was shared by an industry representative who stated:

> *"We want a say in shaping the rules we have to comply with; otherwise, policies may be impractical."*

This reflects a governance model that often relies on the personal intervention of high-ranking officials to bypass weak formal processes and drive action. However, this reliance on top-down authority is also indicative of a power imbalance. The decision-making process for maritime

policy remains highly centralised within the public sector, with limited formal channels for meaningful private-sector participation in policy design. This top-down approach is also considered a barrier to effective policy.

4.4 Discourses

The policy debate surrounding maritime decarbonisation in Thailand is shaped by a collision of discourses. The traditional, deeply entrenched discourse of economic primacy is increasingly being challenged by emerging narratives of sustainability, corporate responsibility, the polluter pays principle, and concerns over a just and equitable transition. These prevailing narratives, values, and problem definitions frame how the issue is understood and prioritised, influencing both policy direction and stakeholder acceptance.

Economic Discourse

The most powerful and persistent discourse frames the challenge primarily through an economic lens in the Thai maritime transport sector. For many stakeholders, particularly smaller operators and the general public, the hierarchy of priorities is clear, which thier livelihoods always come before the environment. This perspective anchors the debate in tangible concerns about costs, competitiveness, and economic survival.

A respondent from the industry stated:

> *"Commercial factors are the most influential discourse… For instance, if the use of expensive alternative fuels leads to higher transport costs without a corresponding increase in freight rates, businesses will struggle to survive."*

This narrative of economic practices encourages caution and risk avoidance, where operators prefer to wait-and-see until technological pathways are clear and costs are manageable.

Sustainability and Corporate Responsibility

Challenging the purely economic narrative is the increasingly influential discourse of "sustainability". While terms like "Green Port" or "Green Shipping" are seen as accessible and useful for communication, interviewees suggested that the broader concept of "sustainability" has more impact because it is more encompassing and forces a consideration of long-term stability alongside short-term costs.

An industry association leader from the Thai Shipowners' Association stated:

> *"The term 'Green' is the easiest for everyone to understand, but sustainability has the greatest long-term influence on corporate decisions."*

For publicly listed companies, this discourse is operationalised through the framework of ***ESG (Environmental, Social, and Governance)***.

As one industry leader explained:

> *"Companies listed on the Thai stock exchange are evaluated on their ESG performance, and a high rating can attract investment."*

This transforms sustainability from a reputational issue into a core component of financial strategy and competitiveness, demonstrating that economic incentives and access to funding are crucial factors driving the private sector to adapt to carbon reduction. This discourse reframes sustainability not as a cost to be minimised, but as a strategic advantage to be pursued.

Additionally, due to the absence of mandatory greenhouse gas reduction measures in the maritime transport industry, the private sector is participating in voluntary initiatives, such as corporate social responsibility or CSR programmes and green initiatives. Thailand's port development policy is being developed to be strictly environmentally friendly between 2015 and 2025. The PAT and other port operators launched "green port" programmes aimed at reducing emissions, improving energy efficiency, and mitigating local environmental impacts. Major seaports like Laem Chabang, Thailand's largest container port, were designated as pioneers for the Green Port initiative (Sankla & Muangpan, 2022). Environmental policies for ports were first introduced in the early 2010s, but by the mid-2010s these efforts accelerated. The Green Port Projects implemented at the PAT ports included measures such as port electrification and automation to reduce idling of cargo machinery, use of alternative and renewable energy on-site (e.g., solar panels on buildings and all-electric port equipment), deployment of energy-efficient equipment, and even operational changes like "slow steaming" of ships to cut greenhouse gas emissions (MD, 2021). These steps were guided by a concrete target: the PAT aimed to cut CO_2 emissions from port operations by 10% by 2019 compared to 2013 levels, reflecting Thailand's commitment under its climate strategies (MD, 2021). This progress was evident by the early 2020s that Thailand's ports received international recognition for their green strides – for instance, multiple ports earned the Green Port Award System (GPAS) certification from the APEC Port Services Network, an honour awarded to ports meeting high environmental standards (MD, 2021). Laem Chabang Port was among those recognised in 2018 for improvements in energy efficiency and emissions reduction. Likewise, Thai ports partnered with regional bodies like the Partnerships in Environmental Management for the Seas of East Asia or PEMSEA to implement the Port Safety, Health and Environmental Management System (PSHEMS), achieving externally audited standards in environmental management (MD, 2021). By 2023, the PAT reported measurable results: over a 5% reduction in carbon emissions had been accomplished, alongside more than $10 million of investments in green infrastructure and technologies (Sankla & Muangpan, 2022). These outcomes demonstrate that the narrative of "green ports" moved from discourse to reality, shaping how port projects were planned (with environmental impact assessments and mitigation in mind) and how existing ports were retrofitted for sustainability. The concept of "Smart Ports" also gained traction, combining digital innovations with eco-friendly practices to optimise logistics while minimising environmental footprint (Sankla & Muangpan, 2022). Overall, sustainability discourse spurred the PAT to pursue cleaner energy, pollution reduction, and community-friendly port operations, aligning maritime infrastructure development with broader green growth objectives.

Consequently, Thai policymakers explicitly aligned maritime transport development with sustainable development goals (SDGs) and "green growth" strategies. The country's 20-Year National Strategy (2018–2037) devoted one pillar to "Eco-Friendly Development and Growth", emphasising that economic progress must go together with environmental stewardship (MD, 2021). In the transport sector, the Ministry of Transport's long-term plan similarly highlighted "Green & Safe Transport" in promoting the use of clean fuels and emission reductions as core objectives alongside efficiency and inclusivity (MD, 2021). Within this framework, the Maritime

Development Strategy was formulated that called for "promoting sustainable maritime-based economic growth with eco-friendly maritime transport and tourism" (MD, 2021). In other words, environmental protection was no longer a concern but became a guiding principle of maritime policy planning. Thailand's Marine Department acknowledged that a robust maritime industry must support sustainable economic growth, and it adopted a national maritime transport policy explicitly aimed at balancing development with environmental protection (MD, 2021). Thus, sustainable development discourse, which references the Sustainable Development Goals (SDGs), "green growth", and Thailand's own Sufficiency Economy philosophy, began appearing regularly in official plans, strategy documents, and speeches about the maritime sector (MD, 2021). This discursive shift at the top levels laid the groundwork for concrete policy changes in regulations, standards, and projects.

Sustainability and Climate Urgency

The concept of "climate urgency" has evolved from a general environmental concern into a specific and powerful political discourse. Climate urgency discourse aims to redefine climate change not as a gradual and distant problem requiring generations to address, but as an urgent, rapidly accelerating, and systemic crisis requiring swift, decisive, and transformative action (Sustainability Directory, 2025). This discourse is the recognition, based on the scientific consensus, that human activities are changing the Earth's climate at an unprecedented rate, posing profound and threatening risks to our planet's very existence, economic security, public health, and geopolitical stability (Sustainability Directory, 2025).

The foundation for the climate urgency discourse in the maritime sector is a clear and strong collection of facts showing that it is a major and rising source of greenhouse gas emissions throughout the world. People typically praise shipping for being more energy-efficient than other forms of transportation on a per-ton-mile basis, while the amount of shipping that happens across the world makes it a major cause of pollution (U.S. DOT, 2023).

In 2018, the maritime shipping sector was responsible for nearly 3% of total global human-caused CO_2 emissions (Schlanger, 2018). This figure represents a significant portion of the global carbon budget and places the sector's emissions are considered comparable to those of the major industrial nation; if international shipping were a country, it would be the world's sixth-largest GHG emitter (Schlanger, 2018). Recent data from the Organisation for Economic Co-operation and Development (OECD) indicates this upward trend has continued, with global maritime emissions rising from 889 to 974 million tonnes of CO_2 between 2019 and 2024 (OECD, 2025). The primary drivers of these emissions are container ships and bulk carriers, which together accounted for nearly half of the sector's total CO_2 output in 2024 due to their large cargo capacities, long-distance operations, and relatively high cruising speeds (OECD, 2025).

In response, a powerful discourse of "climate urgency" has begun to reach the highest levels of international governance (European Commission, n.d.). However, while this narrative has successfully elevated the ambition for decarbonisation, its translation into effective, equitable, and timely action remains fragmented (Global Maritime Forum, 2023). The push for sustainability in maritime transport is a direct response to the sector's climate trajectory. The industry's GHG emissions escalated by 20% in the decade leading up to 2023, and without robust intervention, they are projected to grow by as much as 50% from 2018 levels by 2050 (IMO, 2023). Such a path would undermine the objectives of the Paris Agreement. Consequently, the transition to a sustainable model is not merely an option but an imperative. This involves a shift away from the

conventional fuels that power nearly 99% of the global fleet toward cleaner alternatives (IMO, 2023). Achieving this requires system-wide collaboration, swift regulatory action, and staggering annual investments.

In the case of Thailand, the Thai economy is linked to the sea, with over 90% of its trade transported by ship and a marine tourism sector that contributes significantly to its GDP (ATO, 2024). Logically, Thailand should be at the forefront of planning for the industry's transition. However, an examination of its national climate policies reveals a maritime blind spot, as the country's NDC and its LT-LEDS focus almost exclusively on land-based transport, with no specific targets or measures for decarbonising international shipping (ONEP, 2022a, 2022b). This policy inertia is largely a product of a structural flaw in global climate governance. Under UNFCCC accounting rules, emissions from international shipping are not allocated to national inventories but are managed separately by the IMO (OECD, 2025). This convention renders the emissions from thousands of vessels calling at Thai ports invisible to domestic policymakers, removing a incentive for national action.

Polluter Pays and Just Transition

The two powerful normative discourses are also reshaping the policy landscape. The ***"polluter pays"*** principle, which holds that those responsible for pollution should bear the cost of managing it, is gaining traction and provides the ethical foundation for new regulatory instruments. This narrative underpins the carbon tax and ETS provisions in the draft Climate Change Act, which reframe GHG emissions not as an inevitable by-product of economic activity, but as a prohibitive externality based on internal costs. The idea is to put a price or tax on carbon emissions in transport, which must include environmental costs, as polluters must pay.

An interview with the head of PSL noted (Sahu, 2024):

> *"The IMO should impose a carbon tax of $100/mt of CO_2… doubling after five years" to fund R&D and subsidise green fuels. He further notes that ultimately "our customers will be forced to pay for the transition", implying the cost will be passed down the supply chain in line with polluter-pays logic (Sahu, 2024).*

A respondent in a government agency involved in the maritime transport sector observed:

> *"The polluter-pays principle has gradually gained acceptance, significantly influencing how we approach policy design and implementation."*

At national level, the polluter-pays concept underpins emerging policies like the carbon tax in the Draft Climate Change Act (Tilleke & Gibbins, 2025). By 2022, Thailand explicitly adopted polluter-pays in taxing fossil fuel use, which has been starting with vehicle emissions (MPG, 2024), and the same logic could apply to shipping fuel in the future. This discourse could help justify new regulations and frame them as fair payment for pollution, which also resonates with public demand for cleaner air, such as holding ships accountable for port-city air quality.

At the same time, a critical counter-discourse has emerged around the concept of a ***"just and equitable transition"*.** This discource, which aligns with the principle of Common but Differentiated Responsibilities (CBDR) that Thailand advocates for in international forums, raises serious concerns about the social and economic consequences of aggressive climate policies (Bangkok Tribune, 2024).

An interviewee from the MD highlighted the polluter-pays principle in international negotiations, noting its gradual domestic acceptance, and one MD respondent expressed concerns about a just transition:

> *"It could leave certain groups behind… those who adapt quickly, those who adapt slowly, and those who cannot adapt at all."*

Also, the 2023 IMO GHG Strategy's reference to a just and equitable transition for shipping (Global Maritime Forum, 2023), which highlights the potential for new policies to exacerbate existing inequalities, placing an unfair burden on smaller operators and developing economies.

For example, this discourse split exists within the private sector itself, a dynamic that complicates the government's ability to formulate a cohesive policy. Large, publicly-listed companies operate within an international ecosystem where investors, charterers, and regulators demand strong ESG performance. For these firms, decarbonisation is a strategic imperative for maintaining market access and attracting capital. They may support global carbon pricing to ensure a level playing field. In contrast, smaller domestic operators face different pressures, where local fuel prices and immediate operating costs are paramount. They lack the capital reserves and international market incentives to invest heavily in unproven green technologies. This means the government receives conflicting signals from the private sector. A policy that satisfies the ESG demands of large corporations, such as a high carbon tax, could be devastating for smaller operators. This internal division within the business community makes it difficult to form a unified industry coalition and presents a major political challenge for regulators, who must attempt to balance these competing economic interests.

Overall, these discourses related to decarbonisation in the maritime sector, which are competing, overlapping, and sometimes contradictory, collectively shape the pace and direction of maritime decarbonisation policy. Understanding and engaging with them is essential for designing interventions that are not only technically sound but also politically feasible and socially inclusive.

4.5 The interconnected of policy arrangement

The policy arrangement for maritime decarbonisation in Thailand is in a state of profound flux, characterised by interactions of interconnected, reinforcing changes across all four dimensions of the policy arrangement concept, which are unsettled and unstable.

The primary driver of this transformation has been the entry of new ***actors***, most notably the DCCE, which has introduced a powerful climate-focused agenda into a traditionally maritime-centric domain. These new actors have successfully championed a new ***discourse*** centred on sustainability, climate urgency, and the polluter pays principle. This discursive shift has provided the legitimacy and political momentum for the creation of ambitious new national ***rules***, such as Thailand's Climate Change Act and the formal commitment to adopt stringent IMO targets. However, the introduction of these ambitious rules has, in turn, exposed gaps in the existing distribution of ***power and resources***. The most critical of these is a knowledge deficit within the key implementing agencies and the absence of the institutionalised financial incentives required to mobilise private sector investment. This resource deficit, combined with the ambiguous

mandates of the various ***actors***, creates a power vacuum and reinforces the institutional rigidity that prevents the effective implementation and enforcement of the new ***rules***.

The analysis of this policy arrangement reveals that reform requires not just new laws or agencies but an integrated approach that aligns actors, clear rules, capable institutions, and shared discourses. This sets the stage for the next chapter's examination of the institutional barriers and enablers driving or constraining in the governance of the decarbonisation of Thailand's maritime transport sector.

Chapter 5
Institutional Barriers and Enablers in Governing Decarbonisation of Maritime Transport in Thailand

Building on the policy arrangement context outlined in Chapter 4, this chapter examines the specific institutional attributes that influence the implementation of maritime decarbonisation policy in Thailand. Drawing on the analytical framework of institutional attributes from PERMAGOV (Flannery et al., 2024), the findings show how governance arrangements, actor dynamics, and institutional structures either hinder or facilitate policy effectiveness. While barriers and enablers are presented in separate sections, it is important to stress that they are interrelated and often coexist within the same institutional settings. The chapter concludes by examining these interconnections. Data is drawn from expert interviews, five of which explicitly applied the PERMAGOV tool to prioritise these attributes.

5.1 Institutional Barriers

Institutional barriers to maritime decarbonisation in Thailand arise from unclear mandates, rigid bureaucratic systems, insufficient incentives, and imbalanced power relations. The analysis identified four critical institutional attributes that primarily function as barriers, impeding Thailand's progress toward its maritime decarbonisation goals.

Actor Roles and Responsibilities

Ambiguity of roles among agencies was frequently raised in interviews. Unclear mandates and overlapping responsibilities between the MD, OTP, and DCCE emerged as the most prominent barrier. While the creation of the DCCE was intended to strengthen and centralise climate governance, it has led to conflicting functional fragmentation at the sectoral level. The centralisation of policy authority at the top has not translated into integrated implementation on the ground, creating a gap between high-level policy formulation and sectoral implementation. The DCCE possesses the authority to set national targets but lacks the maritime-specific expertise and direct legal instruments to enforce them within the shipping and port sectors. Conversely, the MD holds the sectoral authority and operational responsibility but lacks a clear, formal climate mandate and, as interviews reveal, the requisite technical knowledge.

A respondent from MD said in an interview:

> *"It's not clear for MD's role and responsibilities in regulating Thailand's maritime sector on decarbonisation policies… There are no explicit goal and actor who has the authority and responsibility for GHG emission reduction in Thailand's maritime sector."*

Interview respondents indicated that such ambiguity causes duplication and slows policy implementation. Another respondent stressed:

> *"Unclear responsibilities lead to significant overlaps, slowing policy implementation processes and creating gaps in enforcement."*

Therefore, the establishment of new actors, particularly the DCCE, significantly altered the institutional landscape. DCCE has notably strengthened environmental governance arrangements, actively pushing for climate-focused maritime policy integration.

As one representative highlighted:

> *"DCCE's establishment clarified the national climate strategy but simultaneously intensified coordination challenges with maritime agencies such as the MD."*

Thus, unclear mandates and overlapping responsibilities between the MD, OTP, and DCCE emerged as the most prominent barrier. However, the MD remains the central authority for regulatory matters. Traditional maritime entities like the MD face increased scrutiny and are compelled to realign their activities with broader climate objectives. This creates a policy-implementation gap where high-level national strategy is disconnected from the operational realities and legal frameworks of the maritime sector. This ambiguity weakens accountability, slows decision-making, and creates policy drift, as no single agency has a designated lead actor on GHG reduction in the sector. This reflects the institutional attribute of *actor roles and responsibilities*, where the absence of well-defined mandates prevents effective cooperation across agencies.

Institutionalised Incentives

While maritime decarbonisation requires technical capacity in fuel technologies, GHG accounting, and market-based mechanisms. The absences of sufficient financial and regulatory incentives was identified as a critical barrier to private sector action. This results in dependency on external actors and leaves Thailand in a reactive, rule-taker position at the IMO.

Additionally, high upfront costs for alternative fuels, retrofitting, and new technologies discourage shipowners. The absence of sufficient financial and regulatory incentives was identified as a critical barrier to private sector action.

The shipowner representative stated:

> *"The industry lacks financial incentives, making it difficult to invest in new green technologies, which are expensive."*

Without tangible support, the high costs and uncertain returns of green technologies make investment prohibitive.

As indicated by a shipowner in an interview:

> *"Without financial support, we can't risk investing in alternative fuels with uncertain returns."*

The TSA leader emphasised:

> *"Incentives from the government are very important… Our operations are voluntary and costly. The risks are high, and the benefits are uncertain."*

This leads to a strong call for government-provided incentives. Stakeholders from both the public and private sectors identified institutionalised incentives as crucial for de-risking private investment in a high-cost, voluntary environment. Recognising these gaps, Thailand actively seeks international support and climate finance.

The Ministry of Transport's leadership has stated (Jitrpatima, 2022):

> *"With adequate, timely and equitable support, through technology transfer and cooperation and, most importantly, the availability of and access to ample green financing facilities, Thailand can increase the NDC target to 40% and sooner reach carbon neutrality and net zero emission goals."*

These respondents illustrate the absence of *institutionalised incentives*. Unlike in the EU, where carbon pricing or green financing provides drivers, Thailand lacks mechanisms to reward early movers. As a result, rational business behaviour is to wait until rules and incentives become clear.

Rigidity of Institutions

Despite the international commitments to decarbonisation of the maritime sector, the implementation under Thai domestic law has been delayed. Thailand has agreed to MARPOL Annex VI, and domestic GHG control in shipping is still in its early stages. This extended delay is most likely due to concerns about the domestic fleet's compliance costs and the supply of low-sulphur fuel. This is a clear manifestation of the attribute of institutional rigidity.

A respondent from MD confirmed:

> *"Currently, the only relevant regulation is the Ship Inspection Regulation, which references IMO obligations… Thailand does not yet have specific domestic laws directly supporting GHG reduction in shipping."*

The bureaucratic rigidity in Thailand, characterised by slow adaptation processes and strict, outdated laws, hinders timely compliance with evolving international standards from the IMO.

An interviewee indicated:

> *"Bureaucratic procedures and strict laws make decarbonisation difficult to change due to the many steps involved."*

Another respondent added:

> *"Adjusting to new international standards takes considerable time due to our existing bureaucratic structures and processes."*

This lack of a robust domestic legal foundation also means that enforcement is partial and reliant on existing, non-specific regulations.

As an interviewee noted:

> *"Enforcement mechanisms of current laws are only effective where legally mandated, but these instances are limited and not comprehensive enough to significantly reduce carbon emissions."*

Another respondent emphasised:

> *"Without the legal force and penalties of formal law, compliance is weak. Non-binding rules focus on raising awareness, but without legal enforcement, compliance tends to be lower."*

Actor Control (Power Distribution)

Decision-making remains highly centralised within the public sector, with limited formal channels for private-sector input into policy design. This reliance on top-down authority is indicative of a significant power imbalance.

A representative of the MD said:

> *"The private sector plays a very important role in reducing GHG emissions, while the government just sets up policies. Therefore, the private sector should also be involved in designing policies."*

These issues were highlighted by a shipper in an interview:

> *"We want a say in shaping the rules we have to comply with; otherwise, policies may be impractical."*

While this enables decisive action when leaders prioritise an issue, it also excludes stakeholders and reduces legitimacy. This imbalance reflects weaknesses in *actor control*. Policies risk being impractical because they are not informed by implementers' realities.

5.2 Institutional enablers

Although institutional barriers dominate the current landscape of maritime decarbonisation in Thailand, several institutional attributes hold the potential to become enablers if adequately supported. These attributes are not yet fully realised but represent emerging opportunities for strengthening governance.

Key potentially institutional enablers identified through analysis could be:

Development and Use of Knowledge

The present knowledge deficit is widely recognised as a barrier, yet the potential for knowledge development offers an enabling pathway. Knowledge serves as the foundation for effective policymaking. Enhancing technical expertise within both public and private sectors is viewed as the foundational enabler for effective policymaking.

Decarbonisation is a technical domain, such as fuel technologies, energy efficiency metrics, and market-based mechanisms. In the absence of adequate internal expertise, government agencies are unable to independently assess policy alternatives, analyse proposals from the IMO or industry, or formulate effective regulations tailored to specific policies and regulations.

The scarcity of specialised human resources was framed as a major obstacle to progress, with one interviewee noted:

> *"The lack of experts in GHG reduction, both technical and academic, is the most important weakness in the maritime sector of Thailand."*

For this reason, interviewees repeatedly emphasised the importance of robust capacity-building programmes and knowledge dissemination initiatives

As one representative of the MD said in an interview:

> *"If knowledge is used in supporting decarbonisation policies, it can have a great impact."*

Another respondent from the public sector added:

> *"Currently, both the public and private sectors still lack knowledge… Without it, there's no clear direction forward."*

This reflects that while Thailand currently lags behind, targeted investment in knowledge creation could transform the existing institutional barrier into an enabler for adaptive policymaking. In addition, the application of the PERMAGOV diagnostic tool in stakeholder interactions encouraged actors to reflect on knowledge gaps and opportunities for learning, which became a process of capacity-building. For example, the TGO already manages MRV systems for carbon accounting in other sectors. If this expertise were extended to maritime transport, Thailand could develop emissions baselines for ships and ports, which are currently absent.

In practice, an enabling system would look like:

- A national Maritime GHG Data Centre, coordinated by TGO and MD, collecting reliable emissions data from Thai-flagged ships and ports.
- Regular training programmes for MD and PAT officials in GHG accounting, supported by IMO and international donors.
- Academic partnerships (e.g., with Chulalongkorn University's Maritime Research Centre and Faculty of International Maritime Studies, Kasetsart University) producing local knowledge on fuel pathways and cost-benefit analyses for alternative fuels.

Such developments would shift Thailand from being a rule-taker to a rule-shaper, with the ability to adapt IMO standards to national contexts and proactively propose measures at the international level.

Actor Connectivity

Fragmentation among agencies is a major challenge, but the expansion of governance actors also creates opportunities for greater actor connectivity. Industry groups such as the TSA and large private operators like the PSL already engage in policy discussions, and their involvement could grow into more institutionalised collaboration. Similarly, the PAT's Green Port initiatives show early signs of state–industry cooperation that could be scaled up. Together with cross-sectoral structures, particularly the newly established like the DCCE, they may evolve into coordination platforms that integrate climate priorities into maritime policies.

Improved inter-agency collaboration was consistently highlighted as a powerful enabler. When agencies like the MD, OTP, and DCCE work together, they can reduce duplication, interlink data, and build trust, which directly improves the efficiency of policy implementation.

An interviewee referred to joint projects by indicating:

> *"If knowledge is used in supporting decarbonisation policies, it can have a great "Developing unified reporting frameworks between OTP, MD, and DCCE streamlined processes and reduced compliance ambiguities for operators."*

Another respondent added:

> *"Reducing GHG emissions requires cooperation and integration from many agencies, especially government agencies."*

While fragmented mandates currently create inefficiencies, these same structures could become enablers if connectivity is institutionalised. For example, the newly established DCCE already convenes cross-sectoral committees. If maritime decarbonisation were formally integrated into its mandate, it could serve as a national coordination hub between transport and climate agencies.

In practice, an enabling structure would look like:

- A permanent Maritime Decarbonisation Taskforce, bringing together MD, OTP, DCCE, PAT, TSA, and private companies like PSL, with regular consultations and shared reporting.
- Strengthened industry–government dialogue, where TSA members provide technical input into regulatory design, ensuring feasibility while maintaining ambition.

Such mechanisms would convert the current fragmented landscape into a collaborative governance network.

Actor Accountability

Accountability remains weak, but draft climate change legislation signals the potential for stronger mechanisms. The Climate Change Act proposes emissions trading, carbon taxes, and a climate change fund, while the Clean Air Act establishes public rights to clean air.

For example, accountability would include transparent monitoring, reporting, and auditing systems, encouraging compliance and helping maintain credibility in the eyes of both domestic and international partners. Interviewees consistently identified effective monitoring, evaluation, and enforcement mechanisms as institutional enablers.

A representative of the TGO noted:

> *"Regular training programmes, audits, and transparent reporting systems have significantly improved compliance."*

Another respondent added:

> *"…increased accountability has reduced instances of non-compliance in the maritime industry…"*

If the Climate Change Act and Clean Air Act were implemented, these mechanisms, such as carbon taxes, emissions trading, and climate funds, could transform accountability from a weak spot into a driving force of decarbonisation governance.

In practice, an enabling accountability system would look like:

- Mandatory carbon reporting for shipping companies, with penalties for non-compliance.
- Allocation of carbon tax revenues into a "Maritime Decarbonisation Fund" that supports retrofitting of small and medium-sized vessels.

Such measures would replace voluntary, soft rules with difficult enforcement, creating predictability for investors and compelling compliance across the sector.

5.3 Interconnectedness of institutional barriers and enablers

The analysis reveals that institutional barriers and enablers are not isolated factors but are deeply interconnected. Addressing barriers often requires strengthening enablers, creating a pathway for targeted governance reform. The most critical interaction lies between knowledge, connectivity, and role clarity. The persistent barrier of unclear *Actor Roles and Responsibilities* is directly exacerbated by a lack of shared knowledge and poor *Actor Connectivity*. When government agencies operate in silos with limited technical understanding, mandates naturally blur and overlap. Conversely, strengthening inter-agency collaboration, an enabler, is a direct mechanism for clarifying roles.

As one representative of MD said in an interview:

> *"Better coordination between MD, OTP, and DCCE directly improved our ability to implement international regulations more swiftly."*

Similarly, the barrier of *Institutional Rigidity* can be overcome by leveraging knowledge and accountability. A rigid bureaucracy hesitates to adapt when it lacks the technical expertise to understand new requirements or the data to justify change. By improving the *Development and Use of Knowledge*, agencies are better equipped to make informed, timely decisions. Pairing this with strong *Actor Accountability* mechanisms ensures that adaptation is not just possible but necessary. Finally, overcoming the barriers of insufficient *Institutionalised Incentives* and imbalanced *Actor Control* is linked to improving *Actor Connectivity* between the public and private sectors, which the current lack of incentives is partly a result of a top-down governance model.

As one respondent argued:

> *"If power is shared and incentives are in place, the private sector can be a strong partner in achieving national targets."*

The interaction between these institutional attributes highlights the dynamic nature of governance. Institutional barriers are not static obstacles but symptoms of a policy arrangement under stress, particularly from the introduction of new actors and ambitious climate rules. The identified institutional enablers, such as knowledge, connectivity, and accountability, represent the system's potential pathways for adaptation. However, the analysis shows that realising this potential is not a simple matter of implementing technical fixes. For an institutional enabler like inter-agency collaboration to effectively overcome the institutional barrier of unclear mandates, there must be a corresponding shift in the underlying power dynamics and resource allocation within the broader policy arrangement. This demonstrates that sustainable progress requires a holistic approach that not only addresses specific institutional weaknesses but also fosters a realignment of the entire governance framework to support decarbonisation goals.

The institutional barriers outlined in Thailand's maritime decarbonisation governance are not fixed barriers but rather conditions that hold within them the possibility of transformation. If strategically addressed, knowledge deficits could stimulate the creation of specialised research centres and training hubs, turning weakness into expertise. Financial constraints, instead of limiting action, could be leveraged through innovative instruments such as carbon revenues, investments, and international climate finance, opening pathways for technological adoption. Similarly, regulatory rigidity, once laws like the Climate Change Act are enacted, could provide the legal certainty and predictability that investors and industry actors currently lack. Centralisation, often seen as exclusionary, could serve as a catalyst for swift implementation if political leadership prioritises decarbonisation and aligns national agencies behind common goals.

Finally, economic discourses could be reframed to highlight Thailand's potential to position itself as a competitive low-carbon logistics hub in Southeast Asia. The crucial task, therefore, is not only to recognise these potentials but also to actively cultivate and institutionalise them, thereby converting institutional barriers into enablers that underpin an adaptive, inclusive, and forward-looking governance system.

Chapter 6
Discussion

This chapter reflects on the analytical approach of the thesis, focusing on two key aspects: the complementary insights of the policy arrangement concept and the PERMAGOV diagnostic framework, and the practical insights gained from applying this diagnostic tool in the Thai context. By integrating these two frameworks, the study was able to move beyond a static description of governance to a dynamic diagnosis of its evolving challenges and capacities.

6.1 Complementary Insights from Two Frameworks

The use of both the Policy Arrangement (PA) concept and the PERMAGOV diagnostic framework provided a richer and more nuanced understanding than either framework could have offered alone, and the analysis shows they are interconnected.

The PA served as a macro view that helps observe the governance landscape and its evolution. It was instrumental in identifying the key driver of change in the system. The PA effectively explained the *'what'* and *'why'* of the governance shift by breaking down the complex system into four interconnected parts. Essentially, the PA helps explore how the entry of new change destabilised the existing arrangement. For example, the entry of new climate-focused actors like DCCE, which destabilised the existing arrangement by altering power dynamics, introducing new rules, and shifting dominant discourses.

> *What shifted?*
> The PA identifies a fundamental change in the actors involved, the rules they operate under, the power dynamics between them, and the discourses or narratives they use. Specifically, the DCCE was created, a new Climate Change Act is being drafted, climate agencies now have more influence over transport agencies, and sustainability and polluter pays are now central concepts.
> *Why did it shift?*
> The framework shows that the shift wasn't random. It was driven primarily by the entry of a powerful new actor, the DCCE. This new actor promoted a different discourse, such as sustainability and polluter pays, which legitimised the creation of new rules and altered the balance of power, that has been forcing traditional maritime actors to adapt.

The PERMAGOV framework, in contrast, acts as a high-precision diagnostic tool that translates broad, structural problems identified by the PA into specific, functional issues that can be addressed by policymakers. Rather than the PA, the PERMAGOV institutional attribute framework provided a micro-level perspective. This shift in perspective allows for a more nuanced understanding of the interplay between various institutional attributes, enabling policymakers to tailor their strategies effectively. By focusing on these specific institutional attributes, stakeholders can better address challenges and enhance the overall governance framework.

For example, the PA highlights a broad "resource gap", indicating the system lacks the financial and technical capacity to meet new climate rules. The PERMAGOV framework dissects this general gap into distinct, actionable components. Stakeholders identified two separate issues: a *'Lack of Development and Use of Knowledge*', specifying a deficiency in technical expertise across public and private sectors, and a *'Lack of Institutionalised Incentives*', identifying a shortage of financial

motivation for the private sector to invest in green technologies. This distinction is critical because each diagnosis points toward different solutions, such as the knowledge gap requires capacity-building and training, while the incentive gap requiring financial mechanisms like subsidies or green funds. Basically, the PERMAGOV framework provides the needed for effective policymaking by transforming the PA's observations into a clear diagnostic report that specifies the exact institutional attributes, which are the institutional barriers and enablers that determine the policy implementation capability.

Moreover, the analysis highlighted that institutional attributes are rarely just a barrier or an enabler; they are often a "two-sided coin" whose function depends on the context. For instance, the PA showed the introduction of new actors like the DCCE. This change had the potential to be an enabler by bringing new climate expertise into the governance arrangement. However, the PERMAGOV diagnosis revealed that in its current state, this change primarily manifested as the barrier of '*Unclear Actor Roles and Responsibilities*' because the governance system hadn't adapted to integrate the new actor effectively, specifically in the maritime transport sector. This two-sided perspective shows that an institutional attribute's potential as an enabler is only realised when its implementation is properly structured.

Additionally, using both frameworks moved the analysis from a simple list of problems and solutions to a web of interconnected issues. The PA illustrated the high-level links, such as how new, ambitious rules, like the Draft Climate Change Act, were creating pressure on existing resources. The PERMAGOV tool then allowed for a detailed tracing of this connection on the ground. It showed how the barrier of *'Institutional Rigidity'*, or the inability to change internal processes, directly prevents the strengthening of an enabler like 'Actor Accountability'. Stakeholders cannot be held accountable for new targets if the bureaucratic rules they operate under do not allow for the necessary flexibility. This thesis demonstrates that barriers are not just obstacles in themselves; they often actively suppress the effectiveness of potential enablers.

Finally, the combination of frameworks helps bridge the gap between diagnosis and strategy. The PA is effective at identifying the broad views and leverage points for change. For instance, suggesting that altering the dominant discourse around economic competitiveness could build political will for stronger climate action. The PERMAGOV framework then provides the practical, specific views. It shows that to make this new discourse effective, policymakers must strengthen specific enablers like the 'Development and Use of Knowledge' (to provide evidence for the economic case) and create 'Institutionalised Incentives' (to translate the discourse into action for the private sector). In this way, broad themes identified at a high level by the PA were diagnosed as specific, functional issues by the PERMAGOV tool (see Table 5).

Table 5 *Key themes emerged in the analysis.*

Dimension	*PA Analysis*	*PERMAGOV Diagnosis*
ACTOR Unclear roles and responsibilities	This framework identified friction caused by the arrival of new actors such as the DCCE of the decarbonisation in maritime transport that MD has traditionally managed. into a space traditionally managed by the MD. It showed why roles were unclear because the old arrangement was disrupted without a clear new plan for how these actors would work together.	Stakeholders using this tool pinpointed the specific institutional attribute of 'Actor Roles and Responsibilities' as the single most significant barrier to implementing policy. This could provide ground-level validation for the problem identified by the PA.
RULE Mismatch between ambitious rules and system capacity	The PA revealed a growing tension between the ambitious new rules, such as the draft Climate Change Act and IMO targets, and the existing system's resource limitations, both financial and technical. It demonstrates policymaking where ambition exceeds actual implementation potential.	The PERMAGOV tool gave this tension a precise diagnosis. It identified 'Rigidity of Institutions', the system's inability to adapt quickly to new rules, and a lack of 'Institutionalised Incentives', the financial resource gap, as key barriers. This showed exactly how the mismatch identified by the PA was preventing progress.
RESOURCE/POWER Knowledge as a critical resource and power source	This framework highlighted that knowledge has surpassed financial capital as a key resource in policy discussions. It showed that access to technical data and expertise is now a source of power that influences decision-making, with agencies lacking this resource finding themselves at a disadvantage.	The PERMAGOV tool mirrored this finding perfectly. Stakeholders ranked 'Development and Use of Knowledge' as a top enabler, stating that without it, "there's no clear direction forward". This demonstrated how a high-level shift in resources translates into a critical, practical need on the ground.
DISCOURSE From discourse to policy	This framework suggested that altering the dominant discourse around economic competitiveness could build political will for stronger climate action.	The PERMAGOV tool then provides the practical, specific views. It shows that to make this new discourse effective, policymakers must strengthen specific enablers like the 'Development and Use of Knowledge' (to provide evidence for the economic case) and create 'Institutionalised Incentives' (to translate the discourse into action for the private sector).

In essence, the PA points to where to push for change, while PERMAGOV clarifies how to make that push successful from diagnosis to strategic intervention.

6.2 Reflection on application of the PERMAGOV's Diagnostic Tools

The PERMAGOV diagnostic tool, originally developed for the EU, is both adaptable and relevant in a different political and cultural context, such as Thailand. Combining the PA to provide background context for the PERMAGOV framework facilitates analysis by allowing examining the governance dimensions in the PA to identify the exact sources of issues in the PERMAGOV diagnostic tool. Thus, these two frameworks complement each other, making this thesis more explanatory and understandable. This study adjusted primarily the process of using a tool that was initially designed for workshops to fit with the online interviews.

In context, comparing the Thai context with the EU setting for which the tool was designed provides a better understanding of adaptability, especially different governance styles. In the EU's multi-level governance system, which relies on binding market-based instruments like the Emissions Trading System (ETS), incentives are embedded in the policy framework. In that context, barriers might be more related to the complexity of coordination across the EU member states. In contrast, Thailand's governance is more centralised, and its climate policies often rely on non-binding, voluntary measures. Consequently, the diagnostic tool revealed that attributes like 'Institutionalised Incentives' and 'Actor Control' (power distribution) emerged as far more pronounced barriers in Thailand. The lack of incentives is not just a minor issue but a central failure point in a system that depends on voluntary private-sector action. Similarly, concerns about centralised power reflect hierarchical governance models in which stakeholder information is more immediate than institutional. Therefore, the diagnostic tool's flexibility to capture these different context-specific priorities demonstrates its capacity to reflect underlying political and cultural norms, rather than imposing a one-size-fits-all model of governance.

In practice, the process went beyond simply identifying barriers as initially designed by Flannery et al. (2024) and also included the identification of enablers. A crucial finding was that institutional attributes are not inherently negative or positive; they function as a "two-sided coin".

A respondent observed when applying the PERMAGOC framework during the interview:

> *"These attributes, where I've seen them as barriers, can also be enablers. I would say that in itself (attributes), it's a two-sided coin. It can be both a barrier and an enabler. I was reading (interview materials), and I felt that it was similar."*

This feedback highlighted a limitation in the tool's original design, which focused primarily on identifying barriers. For example, 'Actor Connectivity' can be a significant barrier when it is weak, leading to fragmentation and policy silos. However, when actively fostered, it becomes a powerful enabler that facilitates collaboration and integrated solutions.

Recognising this duality was methodologically vital. The research approach was adapted to explicitly ask participants to identify and rank enablers alongside barriers. This modification proved critical, transforming the diagnostic exercise from a simple problem-finding activity into a more balanced and solution-oriented process.

As another respondent confirmed:

> *"Integrating enablers made the diagnostic process more balanced and actionable, offering clearer paths for improvement".*

This suggests that the tool's utility is maximised when it is used not just to diagnose what the barriers are, but to identify which institutional attributes hold the most potential for positive transformation as enablers.

The application of the diagnostic tool in online face-to-face interviews using Miro boards instead of group workshops has yielded important insights into its application in different situations. This format allowed for deeper discussions, which was particularly effective in the high-context Thai communication culture where sensitive issues are best addressed in private. In addition, the Miro board acted as a neutral, third-party object. It allowed interviewees to depersonalise their feedback by physically moving and ranking cards representing institutional barriers and enablers into the impact/priority matrix board (see Appendix B.) and then considering the interconnectedness among institutional attribute cards in the interaction board (see Appendix C.), which was adapted from the interaction matrix as utilised by Flannery et al. (2024), linking the interconnectedness with arrows; red is negative, and green is positive or an enabler.

Due to the limited time and availability of participants, only five interviews completed the interactive session in the Miro platform to identify institutional barriers and enablers. The application of the diagnostic tool in these online interviews required customisation for each discussion, as the thesis content explores the theoretical aspects of the 11 institutional attributes, while the participants possess limited insights into social science. Consequently, this makes the institutional attributes more challenging to comprehend for those participants who are primarily engaged in practical operations. Moreover, jargon had appeared during most of the interviews, which refers to specialised words and expressions used by specific professions, groups, or fields that are difficult for outsiders to grasp. For instance, the term 'institution' typically denotes large, established organisations with a clear purpose and often a physical location. However, in social science, particularly in sociology, political science, and economics, the concept of 'institution' takes on a more foundational meaning. It encompasses the established and enduring patterns of social relationships and practices that are structured by widely accepted rules, norms, and beliefs. From this perspective, institutions represent the rules of the game that shape human interaction and create social order.

Therefore, the pace of interaction in selecting institutional attribute cards as barriers or enablers and positioning them within the impact/priority matrix was notably slow, especially when considering the interconnections among institutional attributes. The relationships between these attributes remain unexplored. To bridge this gap, it is essential to provide clear explanations and context during the interviews. This approach facilitates better understanding and encourages participants to contribute more effectively, enriching the overall discussion.

This Miro visual and interactive process provided a structured and less confrontational way to discuss sensitive topics. Pointing to a predefined card on a screen is a more comfortable way to critique bureaucratic inefficiency or power imbalances than stating it directly. While a workshop format is designed to build consensus, the private interview setting facilitated the uncovering of more nuanced perspectives and underlying tensions that might not surface in a group discussion. This suggests that the mode of application is not merely a logistical choice but a critical methodological adaptation needed to ensure the tool's effectiveness and the validity of its findings in different cultural contexts.

Chapter 7
Conclusions and Recommendations

This thesis set out to diagnose the institutional conditions governing the decarbonisation of maritime transport in Thailand. By combining a policy arrangement concept with the PERMAGOV diagnostic framework, this study has provided an analysis of the evolving governance landscape, identifying the critical institutional attributes that function as barriers and enablers to effective policy implementation.

7.1 Conclusions: Answering the Main Research Question

The main research question of this thesis is: *How do the institutional attributes function as barriers and enablers in governing decarbonisation of maritime transport in Thailand?*

The answer is that institutional attributes are not inherently barriers or enablers; rather, they acquire these functions depending on how they operate within a policy arrangement that is under stress from global decarbonisation imperatives. In the case of Thailand, the governance of maritime decarbonisation is shaped by the tension between two overlapping arrangements. On the one hand, there is a traditional, policy arrangement centred on maritime safety, port management, and trade facilitation, historically led by the Marine Department (MD) and reinforced by entrenched economic discourses prioritising competitiveness and cost minimisation. On the other hand, an emerging, climate-oriented arrangement is taking shape, driven by the Department of Climate Change and Environment (DCCE), supported by new rules such as the draft Climate Change Act, and underpinned by discourses such as sustainability, climate urgency, and the polluter-pays principle. This tension explains why the same institutional attribute can manifest as both an institutional barrier and an enabler.

Institutional barriers emerge where the traditional arrangement's structures fail to meet new climate demands. The analysis in this thesis shows these are not isolated problems but are symptoms of this deeper misalignment:

- ***Unclear Actor Roles and Responsibilities***: This was identified as the most prominent barrier. It manifests as overlapping mandates and ambiguous authority between the Marine Department (MD) and the new Department of Climate Change and Environment (DCCE), creating a policy-implementation gap where high-level strategy is disconnected from sectoral operations.
- ***Rigidity of Institutions***: The slow pace of bureaucracy and the lengthy process of translating international IMO rules into domestic law create a persistent gap between global expectations and national capacity. This rigidity forces a reactive posture and creates profound regulatory uncertainty for the private sector.
- ***Lack of Institutionalised Incentives***: In a system that relies on voluntary private-sector action, the absence of financial support is a central failure point. The high costs and uncertain returns of green technologies make investment prohibitive, leading to a rational 'wait-and-see' paralysis among shipowners.
- ***Imbalanced Actor Control***: Decision-making remains highly centralised within the public sector, with limited formal channels for private-sector input. This top-down approach risks creating policies that are misaligned with operational realities and are perceived as impractical by the industry that must implement them.

Institutional enablers, conversely, are the institutional attributes that represent the system's potential pathways for adapting and forming a new, more coherent policy arrangement. These are not yet fully realised but were consistently identified as critical for progress:

- ***Development and Use of Knowledge***: This is the foundational enabler. The current "knowledge deficit," particularly within the public sector, was identified as the most critical resource gap. Building technical expertise is essential to empower agencies to make informed decisions and move from being rule-takers to rule-shapers.
- ***Actor Connectivity***: Enhanced collaboration between agencies like the MD, DCCE, and OTP is seen as a direct mechanism for overcoming fragmentation. Effective connectivity helps reduce duplication, interlink data, build trust, and clarify the ambiguous roles that currently act as a primary barrier.
- ***Actor Accountability***: Strengthening transparent monitoring, reporting, and auditing systems is crucial for ensuring compliance and building credibility with international partners. This helps transform policy goals into measurable actions and reduces instances of non-compliance.

Thus, the same institutional attribute can manifest to be both an institutional barrier and an enabler. For example, actor roles and responsibilities are currently fragmented and overlapping, producing barriers of inefficiency and weak accountability, yet the creation of the DCCE also holds the potential to become an enabler of coordination and integration if properly empowered. Similarly, knowledge deficits function as barriers when agencies lack technical expertise, but the ongoing development of training programmes and international partnerships suggests the potential for knowledge to evolve into an enabler of informed decision-making and adaptive governance. Financial constraints remain a clear barrier, especially for small and medium-sized operators, but emerging ESG frameworks and proposed carbon pricing mechanisms could transform finance into a driver of innovation. Regulatory rigidity delays the translation of IMO obligations into Thai law, yet once enacted, instruments like the Climate Change Act could provide the predictability and accountability currently missing. Even centralised authority, which excludes private-sector input, could act as a catalyst for rapid change if senior political leadership aligns decisively with climate goals.

The overall conclusion is that Thailand's maritime governance system is currently incapable to decarbonising. However, it is at a turning point where institutional barriers and enablers coexist within the same institutional attributes. The future direction of national governance will depend on whether Thailand can strategically create conditions conducive to national development from the current barriers. This requires institutional reforms that clarify mandates and strengthen accountability and mechanisms that reframe economic discourses from resistance to opportunity. By doing so, Thailand could reposition itself from a reactive follower of international rules to a proactive regional leader in maritime decarbonisation governance. Importantly, the application of the PERMAGOV diagnostic framework made institutional attributes possible to reveal this duality, showing how institutional attributes are not fixed categories but context-dependent functions that may shift between institutional barrier and enabler depending on the dynamics of the policy arrangement.

7.2 Recommendations for future studies

This thesis has provided a diagnosis of the institutional attributes governing maritime decarbonisation in Thailand by uniquely combining the policy arrangement concept with a PERMAGOV diagnostic framework. A key strength of this study was its flexible and participatory application of the diagnostic tool in a one-on-one interview format, which proved highly effective in the Thai context for gathering stakeholder perspectives. The theoretical frameworks, both the policy arrangement concept and PERMAGOV's institutional attribute, offered a multi-layered analysis that connected high-level shifts to specific, functional barriers and enablers on the ground. However, the study's scope was limited by its focus on a small number of central actors, with under-representation from private operators, which represent the domestic maritime transport.

Future research could provide even greater insight into Thailand's maritime governance, building on the findings and limitations of this study. A next step would be to conduct longitudinal studies that track the implementation of the new Climate Change Act and MARPOL Annex VI over time, assessing how policy effectiveness and governance dynamics evolve. Future research should also aim to expand stakeholder diversity, specifically by including more representatives from small and medium-sized private shipping companies and regional ports to ensure a more comprehensive and nationally representative understanding of the challenges. Furthermore, the diagnostic tool could be enhanced to systematically include the identification of institutional enablers from the outset, rather than solely focusing on barriers. Additionally, it should employ simpler, more accessible language to gain further insights from individuals engaged in the maritime sector. Finally, a comparative study applying this diagnostic framework to other ASEAN nations could reveal valuable regional patterns and foster opportunities for collaborative policy approaches. Such an analysis may highlight shared challenges and successful strategies that can be adapted across borders. By leveraging these insights, ASEAN countries could enhance their collective resilience and drive sustainable development initiatives.

7.3 Implications and Policy Recommendations

The findings of this study have significant practical implications for policymakers and stakeholders involved in the implementation of decarbonisation policies in Thailand's maritime sector. The following recommendations might help address the identified barriers and strengthen the enablers.

For the Department of Climate Change and Environment (DCCE):

- Integrate maritime transport into national climate legislation by ensuring that the final Climate Change Act includes specific provisions and targets for the maritime sector. Advocate for a portion of revenues generated from any future carbon pricing mechanism to be earmarked for a "Green Maritime Fund" to provide the institutionalised incentives currently lacking for the private sector.
- Formalise private sector consultation through collaboration with the MD to establish a formal, institutionalised advisory council that includes representatives from the Thai Shipowners' Association, port operators, and technology providers. This will help balance power distribution and ensure that new policies are practical and have industry buy-in.

For the Office of Transport and Traffic Policy and Planning (OTP):

- Align transport strategy with decarbonisation goals by updating the National Transport Strategy to include explicit, measurable targets for GHG emissions reduction from domestic shipping. Commission studies to identify the most cost-effective pathways for decarbonising inland and coastal shipping fleets to provide a clear evidence base for policy.

For the Marine Department (MD):

- Be a formal inter-agency coordination platform in maritime transport in Thailand and proactively lead the establishment of a formal working group or committee with the DCCE, OTP, and TGO. This platform should be tasked with creating a unified national maritime decarbonisation roadmap, clarifying agency roles, and harmonising data collection and reporting to overcome the barrier of role ambiguity.
- Develop a maritime-specific capacity-building strategy by partnering with academic institutions and international organisations to create targeted training programmes for MD staff on topics such as alternative fuels, energy-efficient technologies, and international climate policy. This will build the internal knowledge base needed to reduce reliance on external consultants and adapt to new regulations more quickly.

As an officer at the practitioner level within the MD, I intend to use the insights from this thesis to contribute directly to institutional improvement. The findings provide clear evidence to advocate for tangible actions. First, I will use the diagnosis of 'Development and Use of Knowledge' as a critical enabler to support the creation of targeted, in-house capacity-building programmes for MD staff. Second, leveraging the analysis of fragmented roles and poor connectivity, I can act as an internal advocate for establishing a formal inter-agency coordination platform with the DCCE and OTP, using this research to demonstrate the necessity of such a structure for effective policy implementation. Finally, I will use the findings on lack of incentives and imbalanced power to make a strong case for creating more structured and meaningful channels for private sector consultation, ensuring that the industry is not just a subject of regulation but a partner in designing practical and effective decarbonisation policies.

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Appendices

Appendix A. Interview Guide

PART 1: Interview Questions

Set A: for participants involved in the maritime transport sector

1. **Questions Related to the Organisation**
   - What is your organisation's role in the maritime transport sector?
   - Does your organisation have any vision, policies, measures, concepts, or actions related to decarbonisation in maritime transport? If so, please elaborate.
   - Is your organisation involved in the formulation or implementation of policies related to decarbonisation in maritime transport? If so, how?

2. **Perspectives on Decarbonisation Policies in the Maritime Transport Sector**
   - In your opinion, are the current policies and regulations sufficient to support the decarbonisation goals in maritime transport? (Considering both the IMO's targets for Thai-flagged international sea-going vessels and Thailand's national targets).
   - Who (individuals/organisations/coalition) do you consider to be the key stakeholders involved in the decision-making and enforcement of regulations and/or policies, and what are their roles? (And if you have suggestions, what role should these key stakeholders ideally play?)
   - What key resources (e.g., financial/economic, data, institutional, political) do you think influence the capacity of stakeholders to manage the decarbonisation of Thailand's national/international maritime transport?
   - Which stakeholders (individuals/organisations/groups) do you believe have the greatest capacity to allocate resources, and how do you think this will affect decarbonisation policy?
   - Which rules, regulations, or policies do you think affect decision-making, and how do they influence the involved parties? (And if you have suggestions, what should decarbonisation policies for the maritime transport sector look like?)
   - In your opinion, are the current policy enforcement mechanisms effective in ensuring all parties comply with decarbonisation policies? How so? (And if you have suggestions, what should the enforcement mechanisms be like?)
   - What discourses do you think influence stakeholders' perspectives on the decarbonisation of international maritime transport? How do they affect the acceptance, urgency, and feasibility of such policies?
   - In your opinion, is Thailand facing barriers or challenges in implementing and governing decarbonisation policies in the international and domestic
   - maritime transport sector? If so, what are they?
   - What enabling factors could support the policy implementation and governance for decarbonisation in Thailand's international maritime transport sector?
   - Beyond policies and actions related to global climate change, do you think there are other factors that could impact domestic and international maritime transport activities?

Set B: for participants involved in national climate policies

1. **Questions Related to the Organisation**
   - How does your organisation play a key role in supporting Thailand to achieve its greenhouse gas reduction and carbon neutrality goals?
   - What is your organisation's vision, concept, or action plan regarding greenhouse gas reduction?
   - Is your organisation involved in the formulation or implementation of policies related to greenhouse gas reduction in the maritime transport sector? If so, how?

2. **Perspectives on Greenhouse Gas Reduction and Climate Governance**
   - In your opinion, are Thailand's current policies and regulations sufficient to support the country's carbon neutrality and greenhouse gas reduction goals?
   - Who (individuals/organisations/coalitions) do you consider to be the key stakeholders in the decision-making and enforcement of regulations and/or policies, and what are their roles? (And if you have suggestions, what role should these key stakeholders ideally play?)
   - What key resources (e.g., financial/economic, data, institutional, political) do you think influence the capacity of stakeholders to govern and support Thailand's carbon neutrality and greenhouse gas reduction goals?
   - Which stakeholders (individuals/organisations/groups) do you believe have the greatest capacity to allocate resources, and how do you think this will affect the governance and support of Thailand's carbon neutrality and greenhouse gas reduction goals?
   - Which rules, regulations, or policies do you think affect decision-making, and how do they influence the involved parties? (And if you have suggestions, what should the policy approach be for governing and supporting Thailand's carbon neutrality and greenhouse gas reduction goals?)
   - What discourses do you think influence stakeholders' perspectives on governing and supporting Thailand's climate goals? Do they affect the acceptance, urgency, and feasibility of the country's carbon neutrality target? If so, how?
   - In your opinion, is Thailand currently facing barriers or challenges in governing and supporting its carbon neutrality and greenhouse gas reduction goals? If so, what are they?
   - What enabling factors could support the policy implementation, governance, and achievement of Thailand's carbon neutrality and greenhouse gas reduction goals?
   - In your opinion, what are some ways to promote cooperation between public agencies, the private sector, and the public to achieve the country's greenhouse gas reduction goals?
   - Beyond policies and actions related to global climate change, do you think there are other factors that could impact domestic maritime transport and international maritime transport activities?

PART 2: Application of the PERMAGOV Diagnostic Tool

The questions in this section are follow-up questions regarding the application of the PERMAGOV Institutional Attribute and the Diagnostic Tool.

The application process and follow-up questions consists of:

- **Institutional Barriers**
    - Select 3 institutional attributes that you consider to be significant barriers to policy implementation. Assess their impact and priority for action using the impact/priority matrix.
    - Why did you choose these institutional attributes that function as barriers? How do these barriers affect policy implementation?
    - Are the barriers you selected interlinked with other institutional factors? How do they constrain the implementation?
      What are the opportunities to address these barriers?
    - If you could address one key institutional barrier, which one would you choose? Would this have a positive impact on other institutional factors? How?

- **Institutional Enablers**
    - Select 3 institutional attributes that you consider to be key enablers for policy implementation. Assess their impact and priority for enhancement using the impact/priority matrix.
    - Why did you choose these institutional attributes that function as enablers? How do they support policy implementation?
    - Are the enablers you selected interlinked with other institutional factors? How do they reinforce each other?
      What strategies do you think could enhance their effectiveness?

- Are there any other institutional factors, beyond the 11 listed as detailed in the additional information for this section, that are important for managing the decarbonisation of maritime transport in Thailand?

Additional Information for Part 2

The PERMAGOV diagnostic tool is designed to help analyze and identify institutional barriers and enablers in the European Union's marine governance. It specifically focuses on managing issues in four key areas: maritime transport, marine energy, marine plastic litter, and marine life.

The PERMAGOV institutional attribute framework consists of the following 11 institutional attributes with brief definitions and examples of potential barriers or enabler functions.

Attribute 1:	**Actor eligibility**
Definition:	Determining who should or is allowed to participate in the governance process.
Barrier function:	No clear criteria for determining who should be eligible to participate.
Enabler function:	Stakeholder analysis to group stakeholders and establish clear participation criteria.
Attribute 2:	**Actor roles and responsibilities**
Definition:	Specifying who does what in the governance system.
Barrier function:	Unclear roles and responsibilities, leading to redundant work or lack of coordination.
Enabler function:	Having clear regulations or agreements regarding roles
Attribute 3:	**Power distribution**
Definition:	Specifying who has what decision-making power
Barrier function:	overly powerful groups dominate decision-making; less powerful groups have no voice
Enabler function:	consensus-based decision-making processes and multi-stakeholder committees
Attribute 4:	**Actor accountability**
Definition:	a system that holds participants accountable for their actions
Barrier function:	lack of transparency; no effective monitoring and enforcement systems
Enabler function:	transparency mechanisms and independent oversight systems
Attribute 5:	**Actor connectivity**
Definition:	the way different groups are linked to share information and coordinate actions
Barrier function:	stakeholders lack communication
Enabler function:	having coordinating committees or information-sharing systems
Attribute 6:	**Conflict mechanisms**
Definition:	processes used to resolve conflicts constructively
Barrier function:	no clear methods for managing conflict
Enabler function:	mediation committees and arbitrators

Attribute 7:	**Development and use of knowledge**
Definition:	a system that promotes the use of data and knowledge in decision-making
Barrier function:	lack of data or in-depth knowledge, or data is disconnected, or there is no proper system for utilizing it
Enabler function:	there are scientific advisory committees and open data platforms

Attribute 8:	**Scale of institutions**
Definition:	determining the appropriate level for a problem to manage it effectively
Barrier function:	the institutional level does not match the scale of the problem
Enabler function:	multi-level governance systems and regional cooperation organizations

Attribute 9:	**Rigidity of institutions**
Definition:	the ability of institutions to adapt when situations change
Barrier function:	institutions are too attached to existing rules
Enabler function:	periodic review of regulations and pilot projects

Attribute 10:	**Formality of institutions**
Definition:	the combination of written rules and informal practices
Barrier function:	too much or too little formality
Enabler function:	clearly define important rules while maintaining flexible practices

Attribute 11:	**Institutionalized incentives**
Definition:	creating appropriate incentives for participants to comply with goals
Barrier function:	insufficient incentives or incentives that are not aligned with goals
Enabler function:	creating economic incentives and reward systems

Reference

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ส่วนที่ 1: คำถามประกอบการสัมภาษณ์

ชุด A คำถามสำหรับผู้ให้ข้อมูลที่เกี่ยวข้องกับภาคการขนส่งทางน้ำ

1. คำถามที่เกี่ยวข้องกับหน่วยงาน

- หน่วยงานของท่าน มีบทบาทในภาคการขนส่งทางทะเล อย่างไร ?
- หน่วยงานของท่าน มีวิสัยทัศน์/นโยบาย/มาตรการ/แนวคิด/การดำเนินการ ที่เกี่ยวข้องกับการลดคาร์บอนในการขนส่งทางทะเล หรือไม่ ? อย่างไร ?
- หน่วยงานของท่าน มีความเกี่ยวข้องกับการออกนโยบาย/การดำเนินนโยบาย ที่เกี่ยวข้องกับการลดคาร์บอนในการขนส่งทางทะเล หรือไม่ ? อย่างไร ?

2. ความคิดเห็นต่อนโยบายการลดคาร์บอนในภาคการขนส่งทางน้ำ

- ท่านคิดว่า นโยบายและข้อบังคับที่มีอยู่ในปัจจุบันเพียงพอหรือไม่ ในการสนับสนุนเป้าหมายการลดคาร์บอนในการขนส่งทางน้ำได้หรือไม่ ? (ทั้ง เป้าหมาย IMO ในการขนส่งทางทะเลระหว่างประเทศสำหรับเรือเดินทะเลระหว่างประเทศที่ชักธงไทย และเป้าหมายของประเทศไทย)
- ท่านคิดว่า ใคร (บุคคล/หน่วยงาน/การรวมกลุ่มหรือพันธมิตร) คือ ผู้มีส่วนได้ส่วนเสียหลักที่เกี่ยวข้องกับการตัดสินใจและการบังคับใช้กฎระเบียบและ/หรือนโยบาย และมีบทบาทอย่างไร ?
(และหากมีข้อเสนอแนะ ท่านคิดว่าผู้มีส่วนได้ส่วนเสียหลักควรมีบทบาทเป็นอย่างไร?)
- ท่านคิดว่า ทรัพยากรหลัก (เช่น การเงิน/เศรษฐกิจ ข้อมูล หน่วยงาน การเมือง) อะไรบ้าง ที่มีอิทธิพลต่อขีดความสามารถของผู้มีส่วนได้ส่วนเสียในการจัดการการลดคาร์บอนในการขนส่งทางทะเลระหว่างประเทศของประเทศไทย ?
- ท่านคิดว่า ผู้มีส่วนได้ส่วนเสีย ราย/หน่วยงาน/กลุ่ม ใด มีความสามารถในการจัดสรรทรัพยากรมากที่สุด และคิดว่าจะมีผลต่อนโยบายการลดคาร์บอนอย่างไร ?
- ท่านคิดว่า กฎเกณฑ์/ข้อบังคับ/นโยบาย ใดบ้าง ที่ส่งผลต่อการตัดสินใจ และมีอิทธิพลต่อผู้เกี่ยวข้องอย่างไร ? (และหากมีข้อเสนอแนะ ท่านคิดว่านโยบายการลดคาร์บอนในภาคการขนส่งทางทะเลควรเป็นอย่างไร?)
- ท่านคิดว่า กลไกการบังคับใช้นโยบายที่มีอยู่ในปัจจุบัน มีประสิทธิภาพในการทำให้ทุกฝ่ายปฏิบัติตามนโยบายการลดคาร์บอน หรือไม่ ? อย่างไร ? (และหากมีข้อเสนอแนะ ท่านคิดว่ากลไกการบังคับใช้นโยบายควรเป็นอย่างไร?)
- ท่านคิดว่า วาทกรรม/แนวคิด/ชุดความคิด ใด ที่มีอิทธิพลต่อมุมมองของผู้มีส่วนร่วมเกี่ยวกับการลดคาร์บอนในการขนส่งทางทะเลระหว่างประเทศ ? และส่งผลต่อการยอมรับ ความเร่งด่วน และความเป็นไปได้ของนโยบายการลดคาร์บอนในการขนส่งทางทะเลระหว่างประเทศ หรือไม่ ? อย่างไร ?
- ท่านคิดว่า ประเทศไทยกำลังเผชิญกับอุปสรรค หรือ มีความท้าทาย ในการดำเนินนโยบายและการกำกับดูแลในการลดคาร์บอนในภาคการขนส่งทางทะเลระหว่างประเทศ หรือไม่ ? อย่างไร ?
- ท่านคิดว่า มีปัจจัยสนับสนุนอะไรบ้างที่จะสามารถสนับสนุนการดำเนินนโยบายและการกำกับดูแลในการลดคาร์บอนในภาคการขนส่งทางทะเลระหว่างประเทศของประเทศไทย ?
- นอกเหนือจากนโยบายและการดำเนินการที่เกี่ยวข้องกับการเปลี่ยนแปลงสภาพภูมิอากาศโลก ท่านคิดว่ามีปัจจัยอื่น ๆ ที่อาจส่งผลกระทบต่อการกิจกรรมการขนส่งทางน้ำภายในประเทศและการขนส่งทางทะเลระหว่างประเทศหรือไม่ ?

ชุด B คำถามสำหรับผู้ให้ข้อมูลที่เกี่ยวข้องกับการดำเนินการด้านการเปลี่ยนแปลงสภาพภูมิอากาศ

1. คำถามที่เกี่ยวข้องกับหน่วยงาน

- หน่วยงานของท่าน มีบทบาทสำคัญในการสนับสนุนประเทศไทยให้บรรลุเป้าหมายการลดก๊าซเรือนกระจกและความเป็นกลางทางคาร์บอน อย่างไร ?
- หน่วยงานของท่าน มีวิสัยทัศน์/แนวคิด/การดำเนินการ ที่เกี่ยวข้องกับการลดก๊าซเรือนกระจก อย่างไร ?
- หน่วยงานของท่าน มีความเกี่ยวข้องกับการออกนโยบาย/การดำเนินนโยบาย ที่เกี่ยวข้องกับการลดก๊าซเรือนกระจกของภาคการขนส่งทางน้ำ หรือไม่ ? อย่างไร ?

2. ความคิดเห็นต่อการกำกับดูแลการลดก๊าซเรือนกระจก

- ท่านคิดว่า นโยบายและข้อบังคับที่มีอยู่ในปัจจุบันของประเทศไทยเพียงพอหรือไม่ ในการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศ
- ท่านคิดว่า ใคร (บุคคล/หน่วยงาน/การรวมกลุ่มหรือพันธมิตร) คือ ผู้มีส่วนได้ส่วนเสียหลักที่เกี่ยวข้องกับการตัดสินใจและการบังคับใช้กฎระเบียบและ/หรือนโยบาย และมีบทบาทอย่างไร ?
  (และหากมีข้อเสนอแนะ ท่านคิดว่าผู้มีส่วนได้ส่วนเสียหลักควรมีบทบาทเป็นอย่างไร?)
- ท่านคิดว่า ทรัพยากรหลัก (เช่น การเงิน/เศรษฐกิจ ข้อมูล หน่วยงาน การเมือง) อะไรบ้าง ที่มีอิทธิพลต่อขีดความสามารถของผู้มีส่วนได้ส่วนเสียในในการกำกับดูแลและการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศไทย ?
- ท่านคิดว่า ผู้มีส่วนได้ส่วนเสีย ราย/หน่วยงาน/กลุ่ม ใด มีความสามารถในการจัดสรรทรัพยากรมากที่สุด และคิดว่าจะมีผลต่อการกำกับดูแลและการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศไทย อย่างไร ?
- ท่านคิดว่า กฎเกณฑ์/ข้อบังคับ/นโยบาย ใดบ้าง ที่ส่งผลต่อการตัดสินใจ และมีอิทธิพลต่อผู้เกี่ยวข้องอย่างไร ? (และหากมีข้อเสนอแนะ ท่านคิดว่าแนวทางด้านนโนบายในการกำกับดูแลและการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศไทย ควรเป็นอย่างไร?)
- ท่านคิดว่า วาทกรรม/แนวคิด/ชุดความคิด ใด ที่มีอิทธิพลต่อมุมมองของผู้มีส่วนร่วมเกี่ยวกับในการกำกับดูแลและการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศไทย ? และส่งผลต่อการยอมรับ ความเร่งด่วน และความเป็นไปได้ของเป้าหมายความเป็นกลางทางคาร์บอนของประเทศไทย หรือไม่ ? อย่างไร ?
- ท่านคิดว่า ประเทศไทยกำลังเผชิญกับอุปสรรค หรือ มีความท้าทาย ในการกำกับดูแลและการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศไทย หรือไม่ ? อย่างไร ?
- ท่านคิดว่า มีปัจจัยสนับสนุนอะไรบ้างที่จะสามารถสนับสนุนการดำเนินนโยบาย การกำกับดูแล และการสนับสนุนเป้าหมายความเป็นกลางทางคาร์บอนและการลดก๊าซเรือนกระจกของประเทศไทย ?
- ท่านคิดว่า มีแนวทางในการส่งเสริมความร่วมมือระหว่างหน่วยงานภาครัฐ เอกชน และประชาชนในการบรรลุเป้าหมายการลดก๊าซเรือนกระจกของประเทศ อย่างไร ?
- นอกเหนือจากนโยบายและการดำเนินการที่เกี่ยวข้องกับการเปลี่ยนแปลงสภาพภูมิอากาศโลก ท่านคิดว่ามีปัจจัยอื่น ๆ ที่อาจส่งผลกระทบต่อการกิจกรรมการขนส่งทางน้ำภายในประเทศและการขนส่งทางทะเลระหว่างประเทศ หรือไม่ ?

ส่วนที่ 2 การประยุกต์ใช้เครื่องมือวินิจฉัยปัจจัยเชิงสถาบันจากโครงการ PERMAGOV

คำถามในส่วนนี้จะเป็นคำถามที่ถามเพื่อขอข้อมูลเพิ่มเติม (follow-up questions) จากการประยุกต์ใช้เครื่องมือวินิจฉัยปัจจัยเชิงสถาบันจากโครงการ PERMAGOV โดยขั้นตอนการประยุกต์ใช้และคำถาม ประกอบด้วย

- **ปัจจัยเชิงสถาบันที่เป็นอุปสรรค (Institutional Barriers)**
    - เลือกปัจจัยเชิงสถานบัน 3 ปัจจัย ที่คุณคิดว่าเป็นปัจจัยที่เป็นอุปสรรคสำคัญในการปฏิบัติตามนโยบาย และพิจารณาจัดลำดับถึงผลกระทบ (Impact) และความสำคัญในการแก้ไข (Priority) ด้วย Impact/Priority Matrix
    - ทำไมท่านถึงเลือกอุปสรรคเหล่านี้? และอุปสรรคเหล่านี้ส่งผลอย่างไรต่อการปฏิบัติตามนโยบาย ?
    - ปัจจัยเชิงสถาบันที่เป็นอุปสรรคที่ท่านเลือก มีการเชื่อมโยงกับปัจจัยเชิงสถาบันอื่น ๆ หรือไม่ ? อย่างไร ? และมีโอกาสอะไรบ้างในการจัดการอุปสรรคเหล่านั้น ?
    - หากสามารถแก้ไขปัจจัยเชิงสถาบันที่เป็นอุปสรรคสำคัญหนึ่งข้อ ท่านจะเลือกแก้ไขข้อใด และจะส่งผลเชิงบวกต่อปัจจัยเชิงสถาบันอื่น ๆ หรือไม่ ? อย่างไร ?
- **ปัจจัยเชิงสถาบันที่สนับสนุน (Institutional Enablers)**
    - เลือกปัจจัยเชิงสถานบัน 3 ปัจจัย ที่คุณคิดว่าเป็นปัจจัยที่สนับสนุนสำคัญในการปฏิบัติตามนโยบาย และพิจารณาจัดลำดับถึงผลกระทบ (Impact) และความสำคัญในการพัฒนา (Priority) ด้วย Impact/Priority Matrix
    - ทำไมท่านถึงเลือกปัจจัยสนับสนุนเหล่านี้? และปัจจัยสนับสนุนเหล่านี้ช่วยในการปฏิบัติตามนโยบายได้อย่างไร ?
    - ปัจจัยสนับสนุนที่ท่านเลือก มีการเชื่อมโยงกับปัจจัยเชิงสถาบันอื่น ๆ หรือไม่ ? ช่วยเสริมซึ่งกันและกันอย่างไร? และคุณคิดว่ามีกลยุทธ์อะไรบ้างที่สามารถเพิ่มประสิทธิภาพของปัจจัยเหล่านั้นได้?
- นอกเหนือจากปัจจัยเชิงสถาบัน ทั้ง 11 ปัจจัย (ดังรายละเอียดเพิ่มเติมแนบท้ายเอกสารนี้) มีปัจจัยเชิงสถาบันอื่น ๆ ที่สำคัญต่อการจัดการด้านการลดคาร์บอนในการขนส่งทางน้ำของไทยอีกหรือไม่?

รายละเอียดเพิ่มเติมสำหรับส่วนที่ 2

เครื่องมือวินิจฉัย PERMAGOV เป็นเครื่องมือ (Diagnostic Tool) ที่ออกแบบมาเพื่อช่วยวิเคราะห์และระบุปัจจัยเชิงสถาบันที่เป็นอุปสรรคและปัจจัยที่สนับสนุนในการบริหารจัดการด้านสิ่งแวดล้อมทางทะเล(Marine Governance) ของสหภาพยุโรป โดยเฉพาะการจัดการปัญหาใน 4 ด้านหลัก ได้แก่ การขนส่งทางทะเล พลังงานทางทะเล ขยะพลาสติกทางทะเล และชีวิตทางทะเล

โดย กรอบคุณลักษณะของสถาบันของ PERMAGOV ประกอบด้วยคุณลักษณะของสถาบัน 11 ประการ พร้อมคำจำกัดโดยย่อและตัวอย่างของอุปสรรคที่อาจเกิดขึ้นหรือเป็นปัจจัยสนับสนุน ดังต่อไปนี้

ปัจจัย 1:	**คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)**
คำจำกัดความ:	การกำหนดว่าใครควรเข้าร่วมหรือได้รับอนุญาตให้เข้าร่วมในกระบวนการกำกับดูแล
ปัจจัยที่เป็นอุปสรรค:	ไม่มีเกณฑ์ชัดเจนในการกำหนดว่าใครบ้างที่ควรมีสิทธิ์เข้าร่วม
ปัจจัยที่เป็นสนับสนุน:	การการวิเคราะห์ผู้มีส่วนได้เสีย เพื่อจัดผู้มีส่วนได้ส่วนเสียเป็นกลุ่ม และมีการกำหนดเกณฑ์การเข้าร่วมที่ชัดเจน
ปัจจัย 2:	**บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)**
คำจำกัดความ:	การระบุว่า "ใครต้องทำอะไร" ในระบบการกำกับดูแล
ปัจจัยที่เป็นอุปสรรค:	ไม่มีการระบุบทบาทหน้าที่ชัดเจน เกิดการทำงานซ้ำซ้อนหรือขาดการประสานงาน
ปัจจัยที่เป็นสนับสนุน:	การมีระเบียบข้อบังคับหรือข้อตกลงที่ชัดเจนเกี่ยวกับบทบาท
ปัจจัย 3:	**การกระจายอำนาจ (Power distribution)**
คำจำกัดความ:	การระบุว่า ใครมีอำนาจในการตัดสินใจอย่างไร
ปัจจัยที่เป็นอุปสรรค:	กลุ่มที่มีอำนาจมากเกินไปครอบงำการตัดสินใจ กลุ่มที่มีอำนาจน้อยไม่มีเสียง
ปัจจัยที่เป็นสนับสนุน:	กระบวนการตัดสินใจที่เน้นการเห็นชอบร่วมกัน และคณะกรรมการที่มีตัวแทนหลายฝ่าย
ปัจจัย 4:	**ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)**
คำจำกัดความ:	ระบบที่ทำให้ผู้มีส่วนร่วมต้องรับผิดชอบต่อการกระทำของตนเอง
ปัจจัยที่เป็นอุปสรรค:	ขาดความโปร่งใส ไม่มีระบบติดตามและการบังคับใช้ที่มีประสิทธิภาพ
ปัจจัยที่เป็นสนับสนุน:	กลไกความโปร่งใส ระบบกำกับดูแลอิสระ
ปัจจัย 5:	**การเชื่อมโยงผู้มีส่วนร่วม (Actor connectivity)**
คำจำกัดความ:	วิธีการเชื่อมโยงระหว่างกลุ่มต่าง ๆ เพื่อแบ่งปันข้อมูลและการประสานงาน
ปัจจัยที่เป็นอุปสรรค:	ผู้เกี่ยวข้องขาดการติดต่อสื่อสาร
ปัจจัยที่เป็นสนับสนุน:	มีคณะกรรมการประสานงาน หรือระบบแบ่งปันข้อมูล

ปัจจัย 6: **กลไกแก้ไขความขัดแย้ง (Conflict mechanisms)**

คำจำกัดความ: กระบวนการที่ใช้แก้ปัญหาความขัดแย้งอย่างสร้างสรรค์

ปัจจัยที่เป็นอุปสรรค: ไม่มีวิธีการจัดการกับความขัดแย้งที่ชัดเจน

ปัจจัยที่เป็นสนับสนุน: คณะกรรมการไกล่เกลี่ย และกรรมการอนุญาโตตุลาการ

ปัจจัย 7: **การพัฒนาและการใช้ความรู้ (Development and use of knowledge)**

คำจำกัดความ: ระบบที่ส่งเสริมการใช้ข้อมูลและความรู้ในการตัดสินใจ

ปัจจัยที่เป็นอุปสรรค: การขาดข้อมูลหรือความรู้เชิงลึก ข้อมูลขาดความเชื่อมโยง หรือไม่มีระบบนำข้อมูลมาใช้อย่างเหมาะสม

ปัจจัยที่เป็นสนับสนุน: คณะกรรมการที่ปรึกษาทางวิชาการ และแพลตฟอร์มข้อมูลเปิด

ปัจจัย 8: **ระดับขอบเขตของสถาบัน (Scale of institutions)**

คำจำกัดความ: การกำหนดระดับที่เหมาะสมกับปัญหา เพื่อให้จัดการได้มีประสิทธิภาพ

ปัจจัยที่เป็นอุปสรรค: ระดับของสถาบันไม่เหมาะกับขอบเขตปัญหา

ปัจจัยที่เป็นสนับสนุน: ระบบการบริหารหลายระดับ และองค์กรความร่วมมือในภูมิภาค

ปัจจัย 9: **ความยืดหยุ่นของสถาบัน (Rigidity of institutions)**

คำจำกัดความ: ความสามารถในการปรับตัวของสถาบันเมื่อสถานการณ์เปลี่ยนแปลง

ปัจจัยที่เป็นอุปสรรค: สถาบันยึดติดกฎเกณฑ์เดิมมากเกินไป

ปัจจัยที่เป็นสนับสนุน: การทบทวนกฎระเบียบเป็นระยะ และการดำเนินการนำร่อง (pilot projects)

ปัจจัย 10: **ความเป็นทางการของสถาบัน (Formality of institutions)**

คำจำกัดความ: การผสมผสานระหว่างกฎที่เป็นลายลักษณ์อักษรและแนวทางปฏิบัติที่ไม่เป็นทางการ

ปัจจัยที่เป็นอุปสรรค: ความเป็นทางการที่มากหรือน้อยเกินไป

ปัจจัยที่เป็นสนับสนุน: กำหนดกฎสำคัญให้ชัดเจน แต่ยังคงแนวทางปฏิบัติที่ยืดหยุ่น

ปัจจัย 11: **แรงจูงใจของสถาบัน (Institutionalized incentives)**

คำจำกัดความ: การสร้างแรงจูงใจที่เหมาะสมเพื่อให้ผู้มีส่วนร่วมปฏิบัติตามเป้าหมาย

ปัจจัยที่เป็นอุปสรรค: ไม่มีแรงจูงใจเพียงพอ หรือแรงจูงใจไม่สอดคล้องกับเป้าหมาย

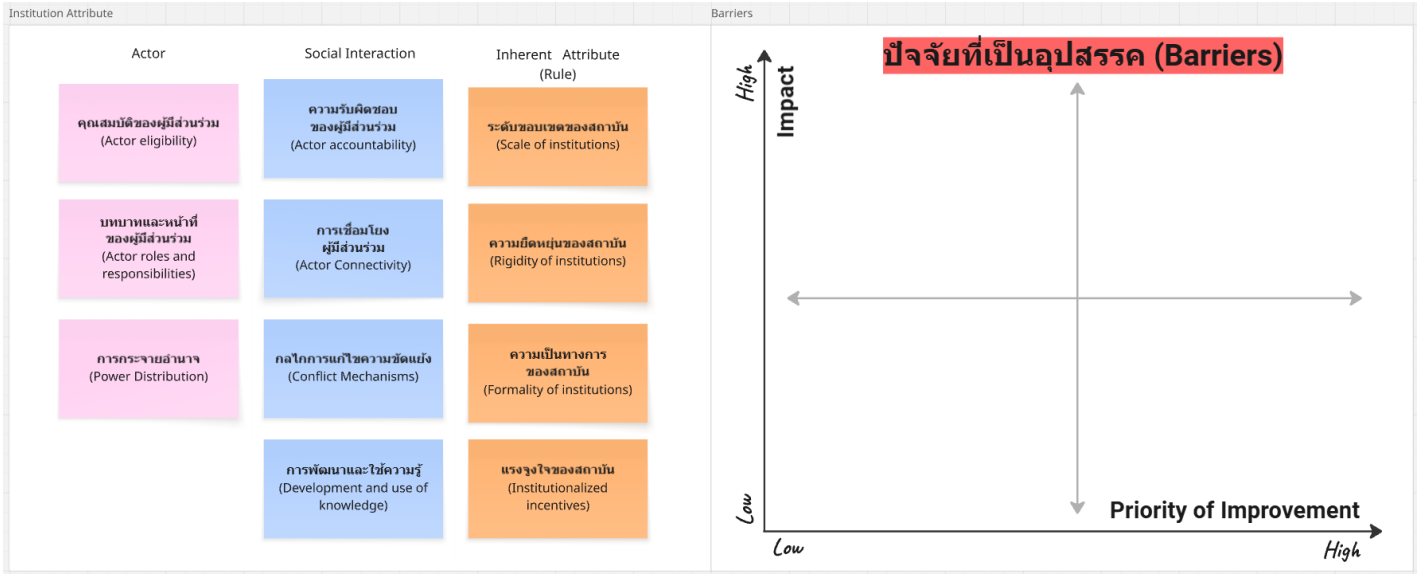
ปัจจัยที่เป็นสนับสนุน: สร้างแรงจูงใจทางเศรษฐกิจ และระบบการให้รางวัล

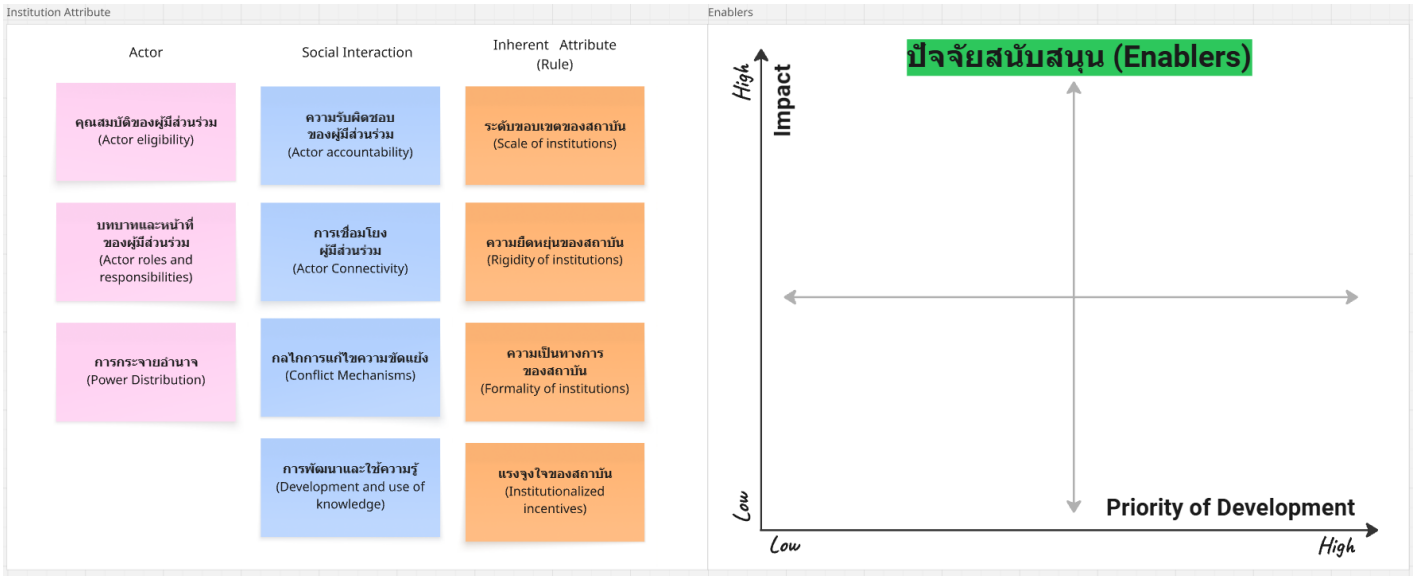
แหล่งอ้างอิง

Flannery, W., West, L., Nielsen, K. N., Knol-Kauffman, M., Passarello, C., Boteler, B., Coelho, N. F., Dyremose, S. C. S., Haapasaari, P., Hegland, T., McLaughlin, S., Toonen, H., Varjopuro, R., & van Leeuwen, J. (2024). *Deliverable 3.2: Report on the Development of Diagnostic Tool*. www.permagov.eu

Appendix B. Impact/Priority Matrix using in this thesis in Miro.com

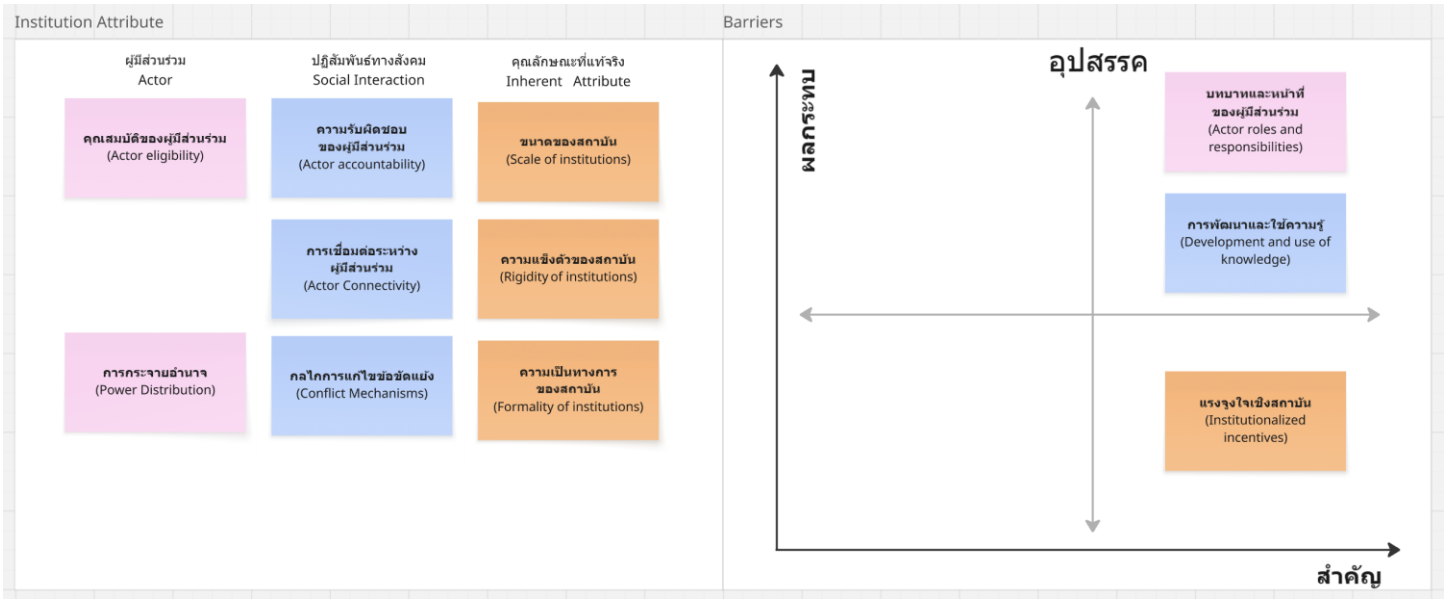
Template

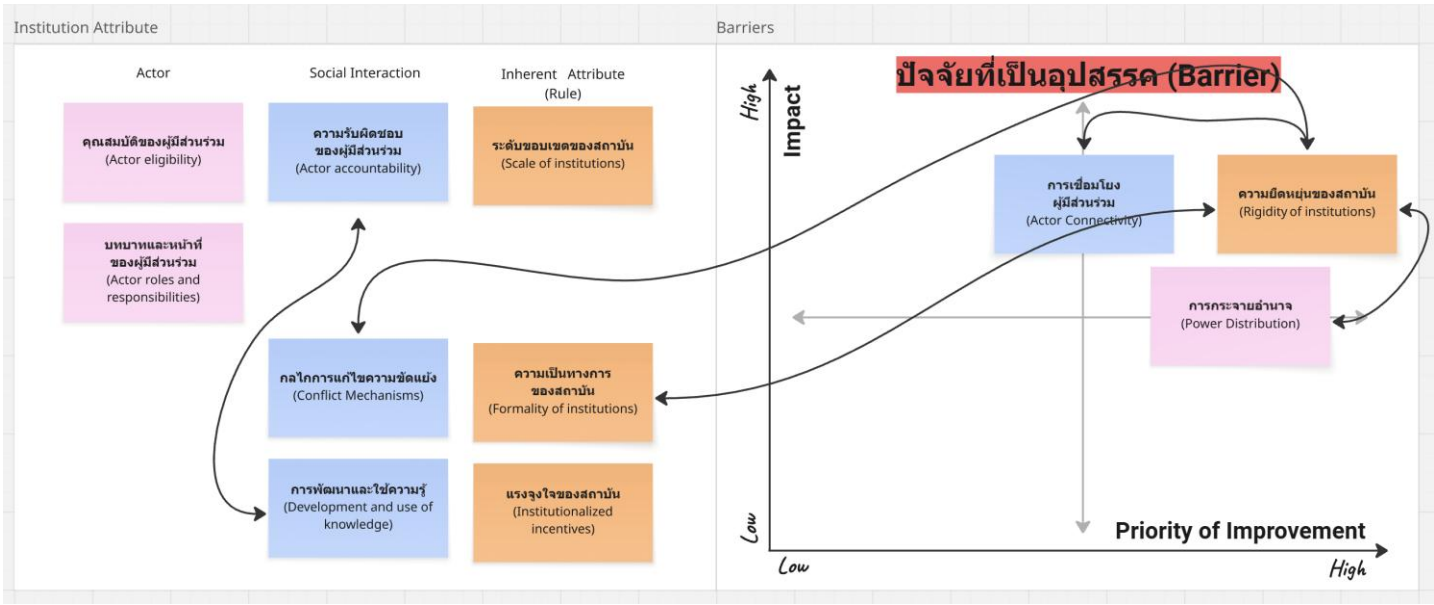


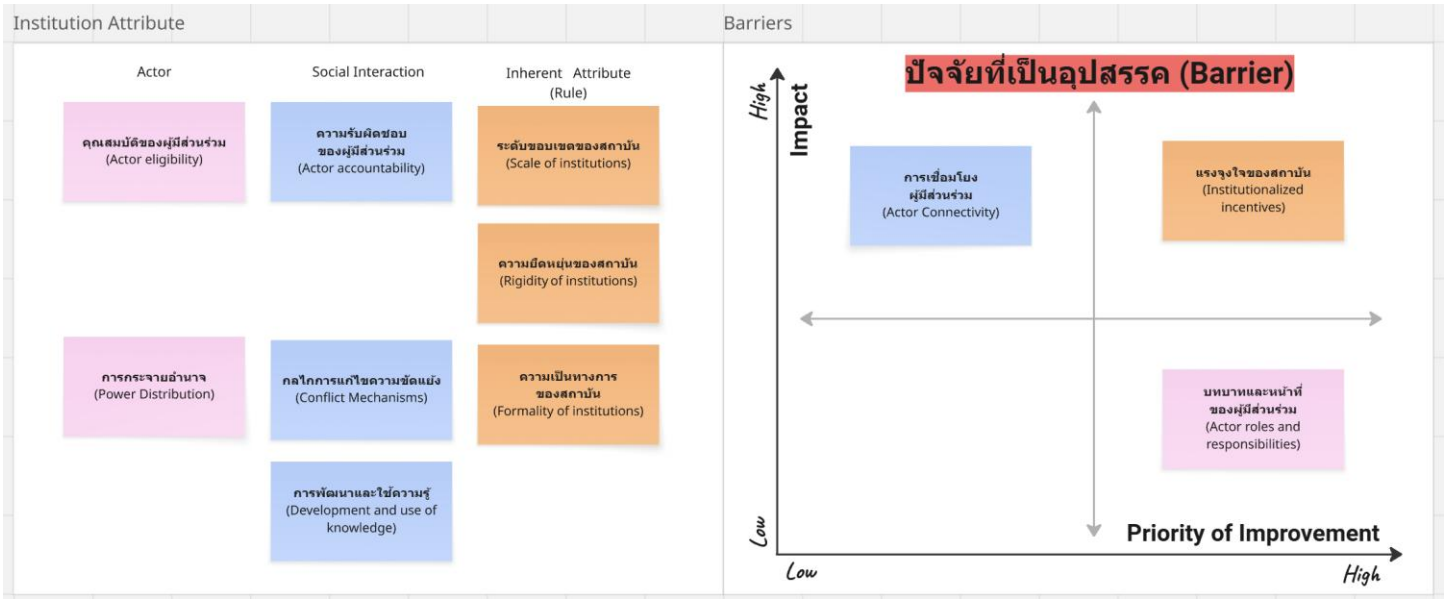


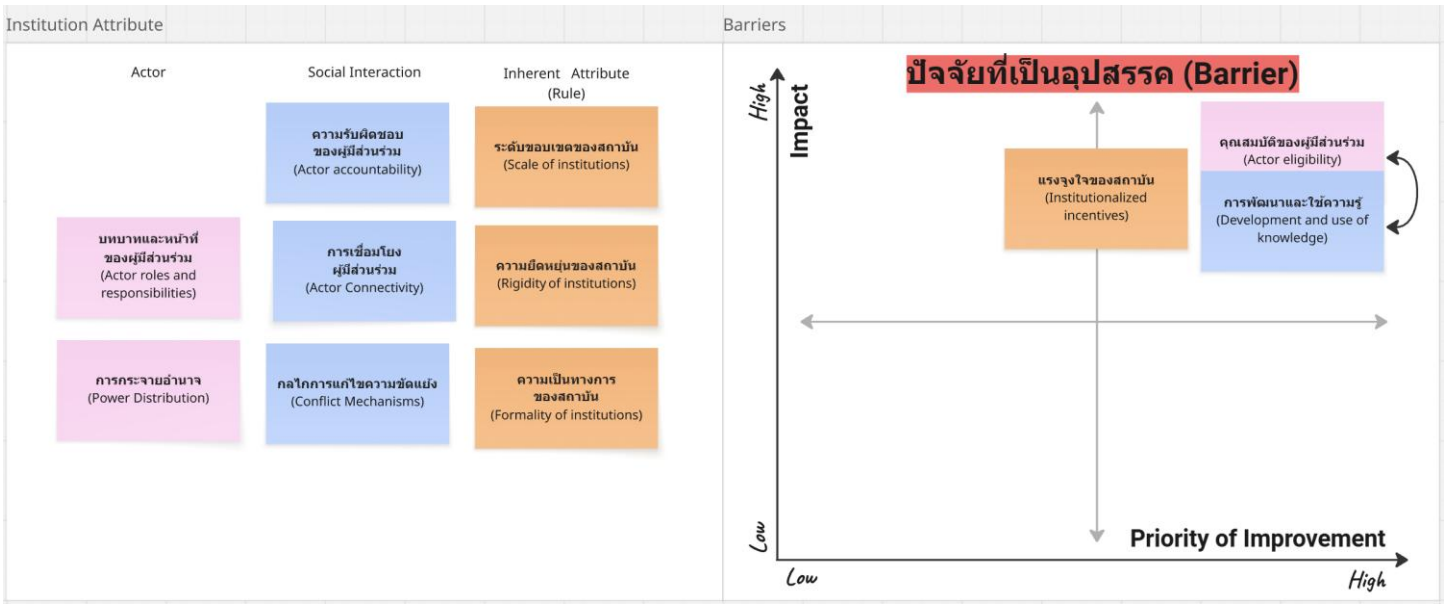
Results from the Expert Interviews

Barrier






Institution Attribute
Actor
Social Interaction
Inherent Attribute (Rule)
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
ระดับขอบเขตของสถาบัน (Scale of institutions)
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
การกระจายอำนาจ (Power Distribution)
กลไกการแก้ไขความขัดแย้ง (Conflict Mechanisms)
ความเป็นทางการของสถาบัน (Formality of institutions)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
Barriers
ปัจจัยที่เป็นอุปสรรค (Barrier)
High
Impact
Low
การเชื่อมโยงผู้มีส่วนร่วม (Actor Connectivity)
แรงจูงใจของสถาบัน (Institutionalized incentives)
บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)
Priority of Improvement
Low
High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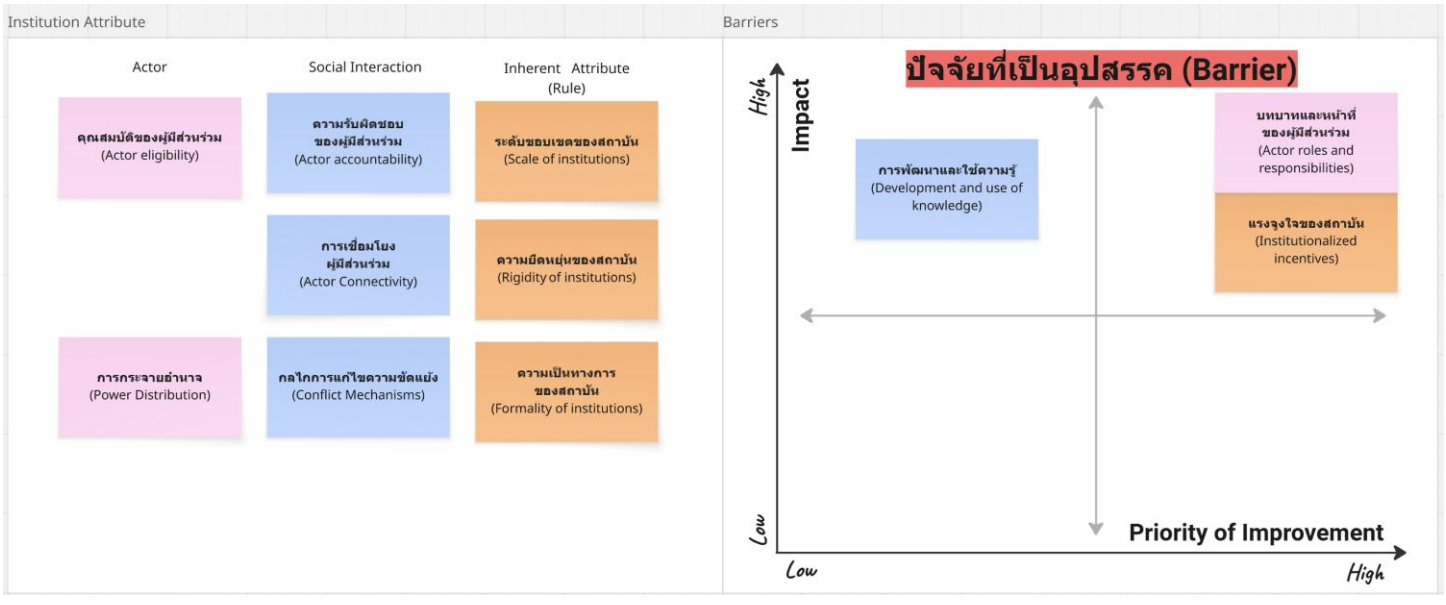
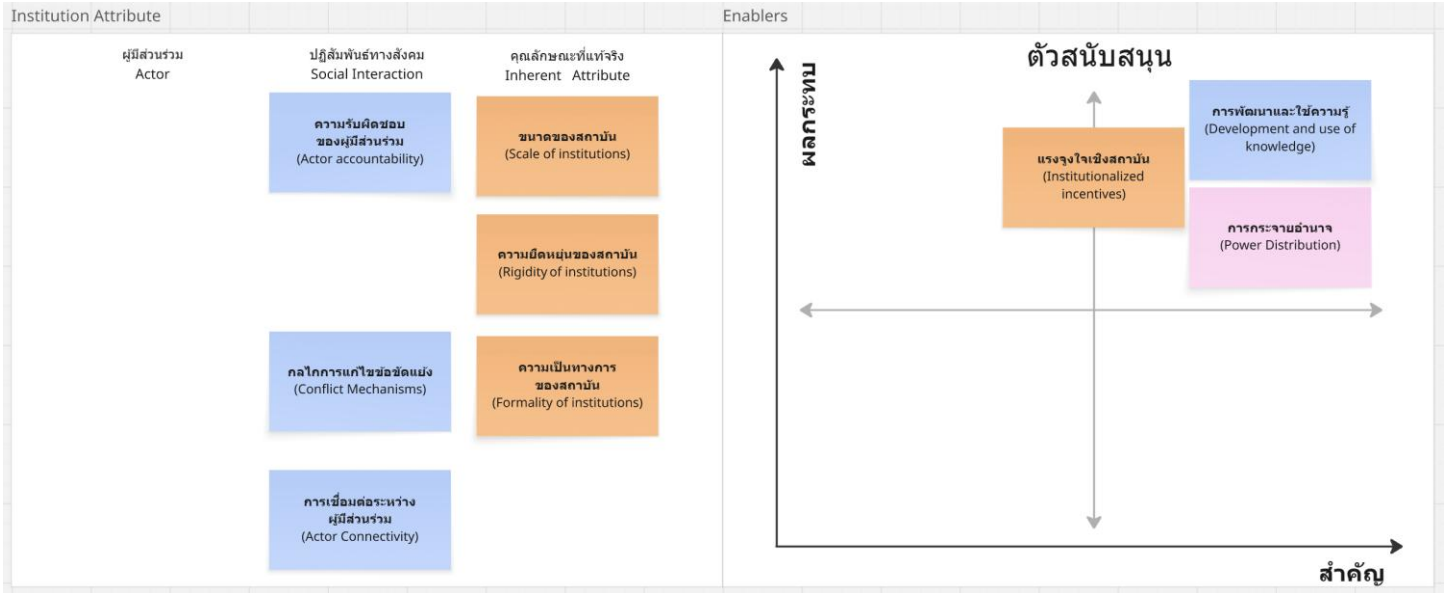
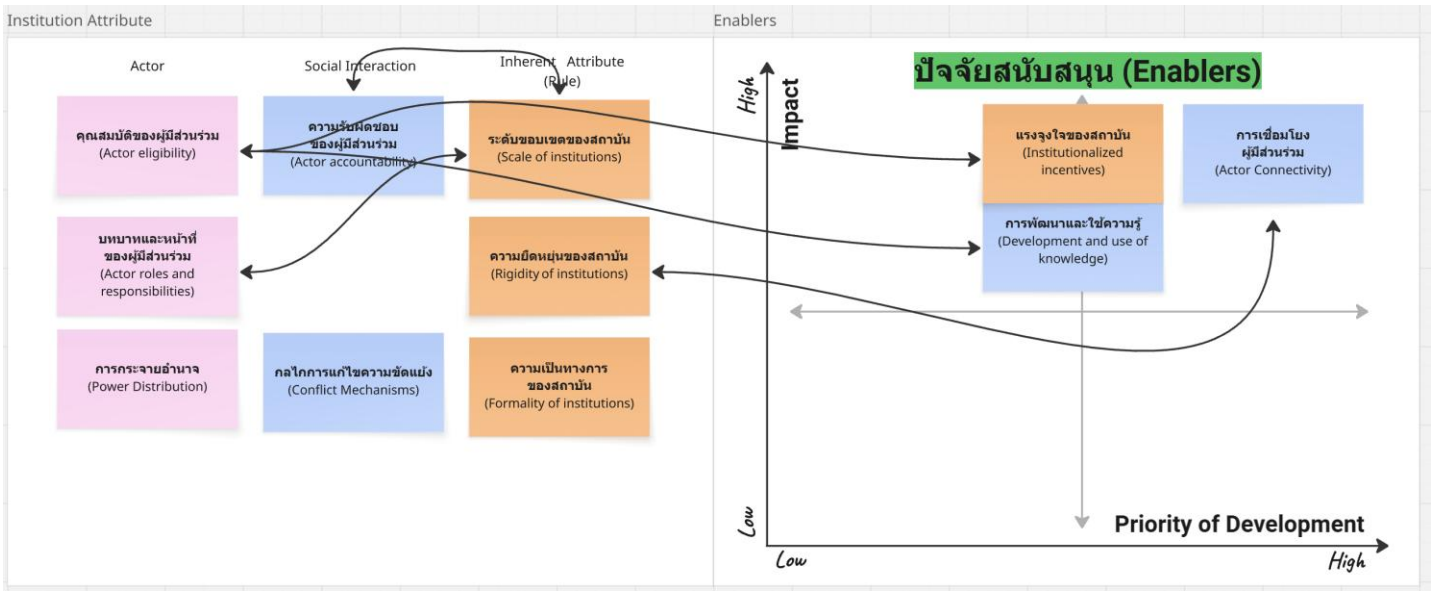
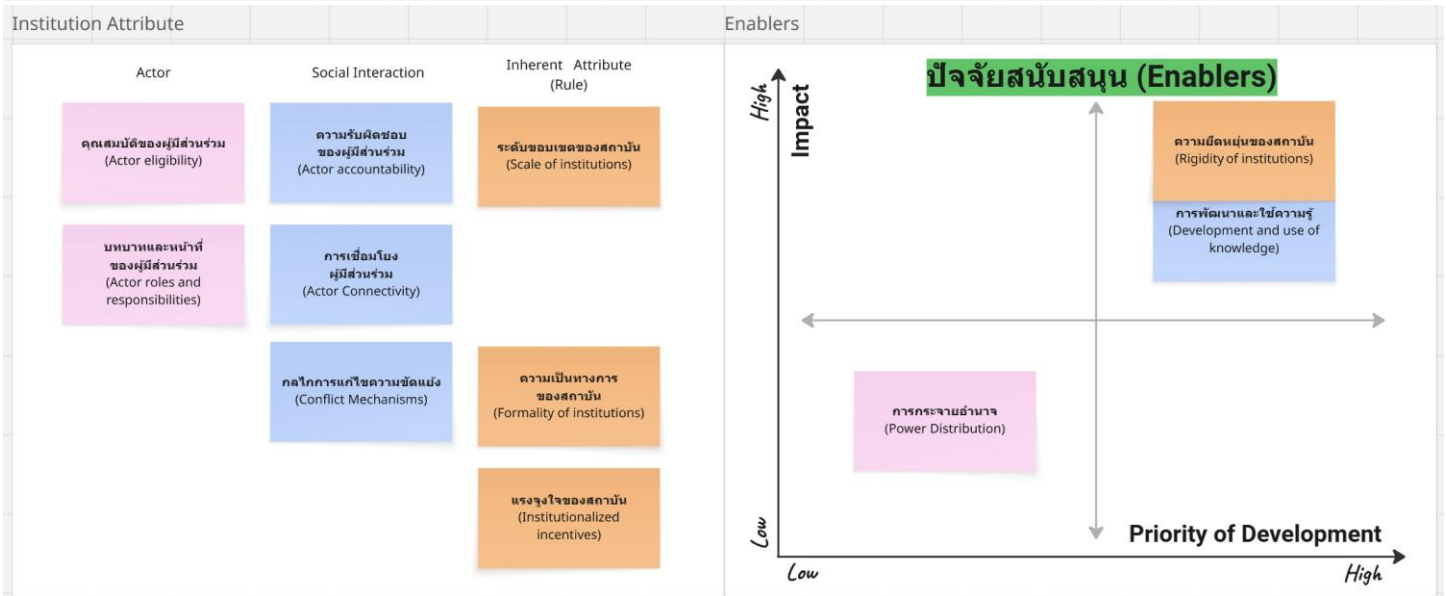
Barriers
ปัจจัยที่เป็นอุปสรรค (Barrier)
High
Impact
Low
แรงจูงใจของสถาบัน (Institutionalized incentives)
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
Priority of Improvement
Low
High

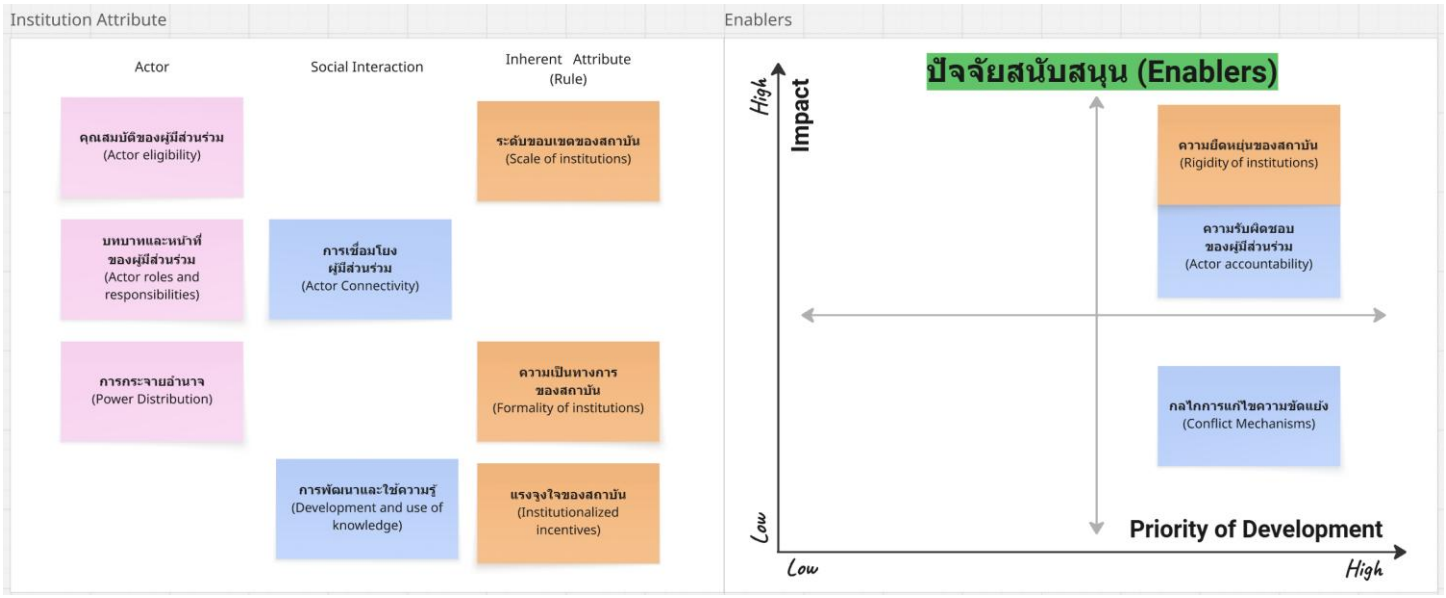

Institution Attribute
Actor
Social Interaction
Inherent Attribute (Rule)
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
ระดับขอบเขตของสถาบัน (Scale of institutions)
การเชื่อมโยงผู้มีส่วนร่วม (Actor Connectivity)
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
การกระจายอำนาจ (Power Distribution)
กลไกการแก้ไขความขัดแย้ง (Conflict Mechanisms)
ความเป็นทางการของสถาบัน (Formality of institutions)
Barriers
ปัจจัยที่เป็นอุปสรรค (Barrier)
High
Impact
Low
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)
แรงจูงใจของสถาบัน (Institutionalized incentives)
Priority of Improvement
Low
High

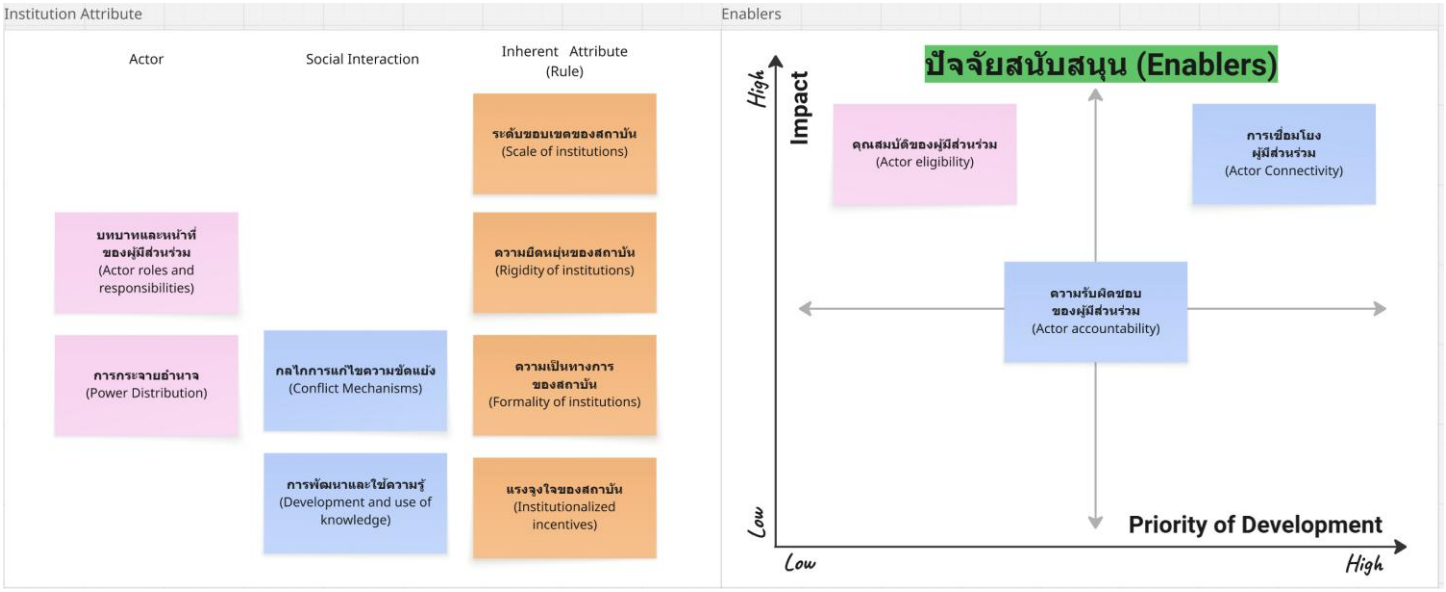
Enablers


Institution Attribute
Enablers
ผู้มีส่วนร่วม
Actor
ปฏิสัมพันธ์ทางสังคม
Social Interaction
คุณลักษณะที่แท้จริง
Inherent Attribute
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
ขนาดของสถาบัน (Scale of institutions)
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
กลไกการแก้ไขข้อขัดแย้ง (Conflict Mechanisms)
ความเป็นทางการของสถาบัน (Formality of institutions)
การเชื่อมต่อระหว่างผู้มีส่วนร่วม (Actor Connectivity)
ตัวสนับสนุน
ผลกระทบ
แรงจูงใจเชิงสถาบัน (Institutionalized incentives)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
การกระจายอำนาจ (Power Distribution)
สำคัญ


Institution Attribute
Enablers
Actor
Social Interaction
Inherent Attribute (Rule)
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
ระดับขอบเขตของสถาบัน (Scale of institutions)
บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
การกระจายอำนาจ (Power Distribution)
กลไกการแก้ไขความขัดแย้ง (Conflict Mechanisms)
ความเป็นทางการของสถาบัน (Formality of institutions)
ปัจจัยสนับสนุน (Enablers)
High
Impact
แรงจูงใจของสถาบัน (Institutionalized incentives)
การเชื่อมโยงผู้มีส่วนร่วม (Actor Connectivity)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
Low
Priority of Development
Low
High

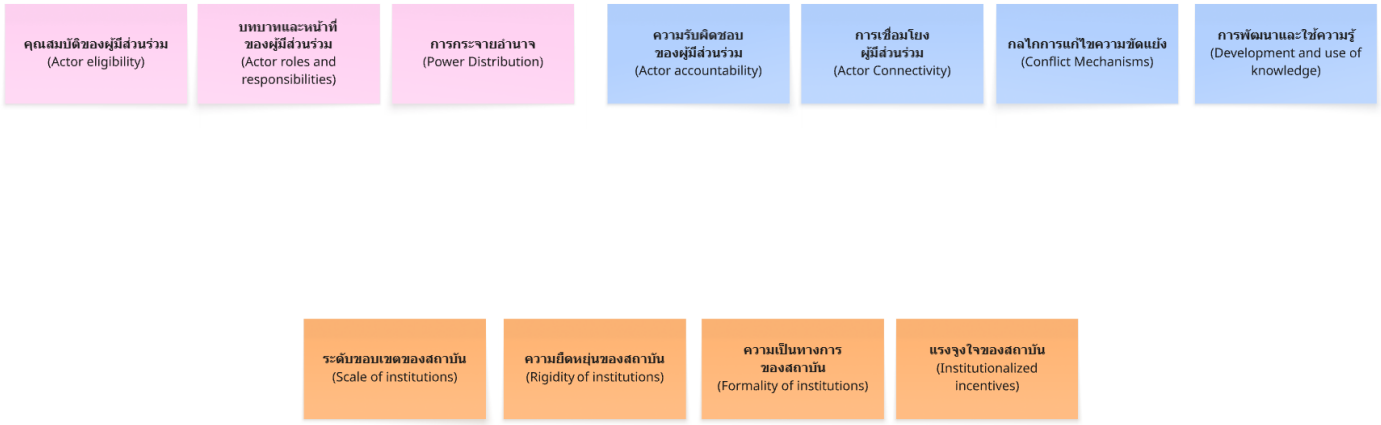

Institution Attribute
Enablers
Actor
Social Interaction
Inherent Attribute (Rule)
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
ระดับขอบเขตของสถาบัน (Scale of institutions)
บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)
การเชื่อมโยงผู้มีส่วนร่วม (Actor Connectivity)
กลไกการแก้ไขความขัดแย้ง (Conflict Mechanisms)
ความเป็นทางการของสถาบัน (Formality of institutions)
แรงจูงใจของสถาบัน (Institutionalized incentives)
ปัจจัยสนับสนุน (Enablers)
High
Impact
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
การกระจายอำนาจ (Power Distribution)
Low
Priority of Development
Low
High


Institution Attribute
Enablers
Actor
Social Interaction
Inherent Attribute (Rule)
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
ระดับขอบเขตของสถาบัน (Scale of institutions)
บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)
การเชื่อมโยงผู้มีส่วนร่วม (Actor Connectivity)
การกระจายอำนาจ (Power Distribution)
ความเป็นทางการของสถาบัน (Formality of institutions)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
แรงจูงใจของสถาบัน (Institutionalized incentives)
ปัจจัยสนับสนุน (Enablers)
High
Impact
Low
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
กลไกการแก้ไขความขัดแย้ง (Conflict Mechanisms)
Priority of Development
Low
High


Institution Attribute
Enablers
Actor
Social Interaction
Inherent Attribute (Rule)
ระดับขอบเขตของสถาบัน (Scale of institutions)
บทบาทและหน้าที่ของผู้มีส่วนร่วม (Actor roles and responsibilities)
ความยืดหยุ่นของสถาบัน (Rigidity of institutions)
การกระจายอำนาจ (Power Distribution)
กลไกการแก้ไขความขัดแย้ง (Conflict Mechanisms)
ความเป็นทางการของสถาบัน (Formality of institutions)
การพัฒนาและใช้ความรู้ (Development and use of knowledge)
แรงจูงใจของสถาบัน (Institutionalized incentives)
ปัจจัยสนับสนุน (Enablers)
High
Impact
Low
คุณสมบัติของผู้มีส่วนร่วม (Actor eligibility)
การเชื่อมโยงผู้มีส่วนร่วม (Actor Connectivity)
ความรับผิดชอบของผู้มีส่วนร่วม (Actor accountability)
Priority of Development
Low
High

Appendix C. Interaction Board

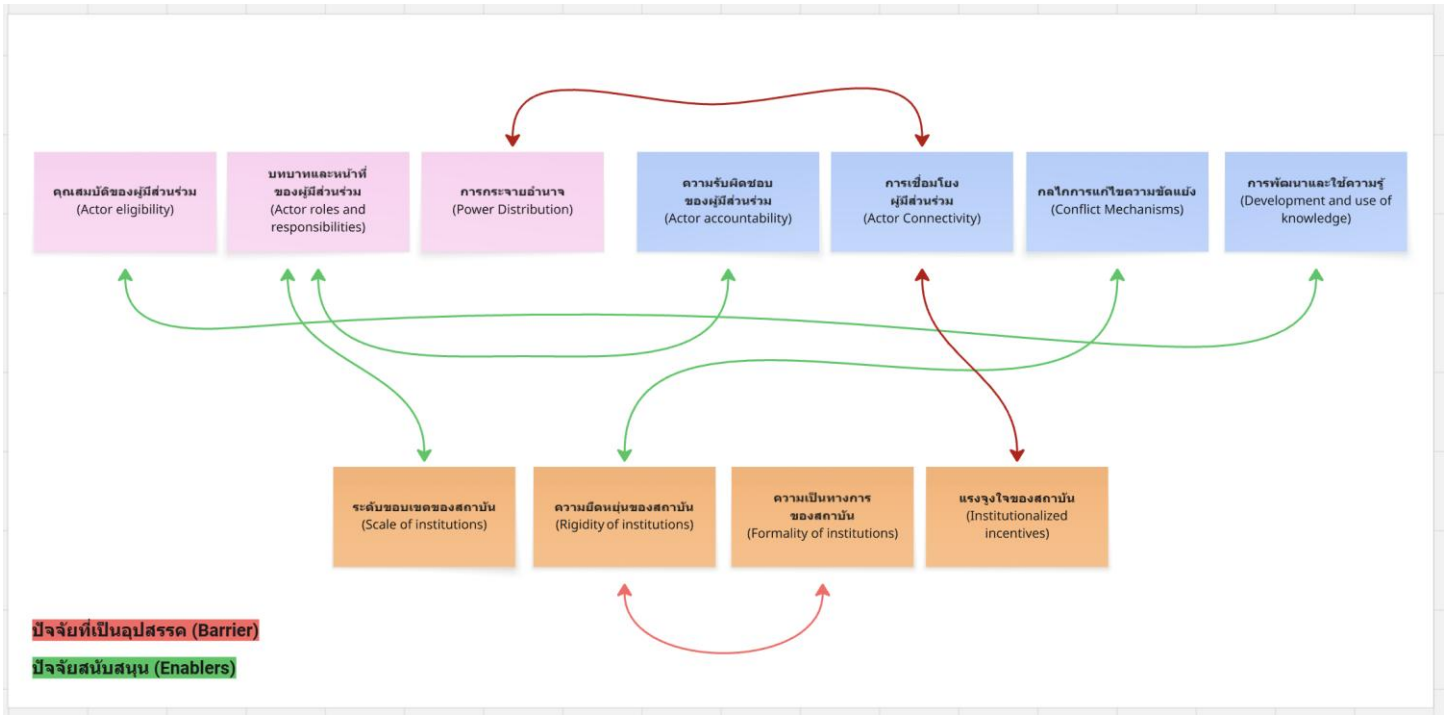
Template

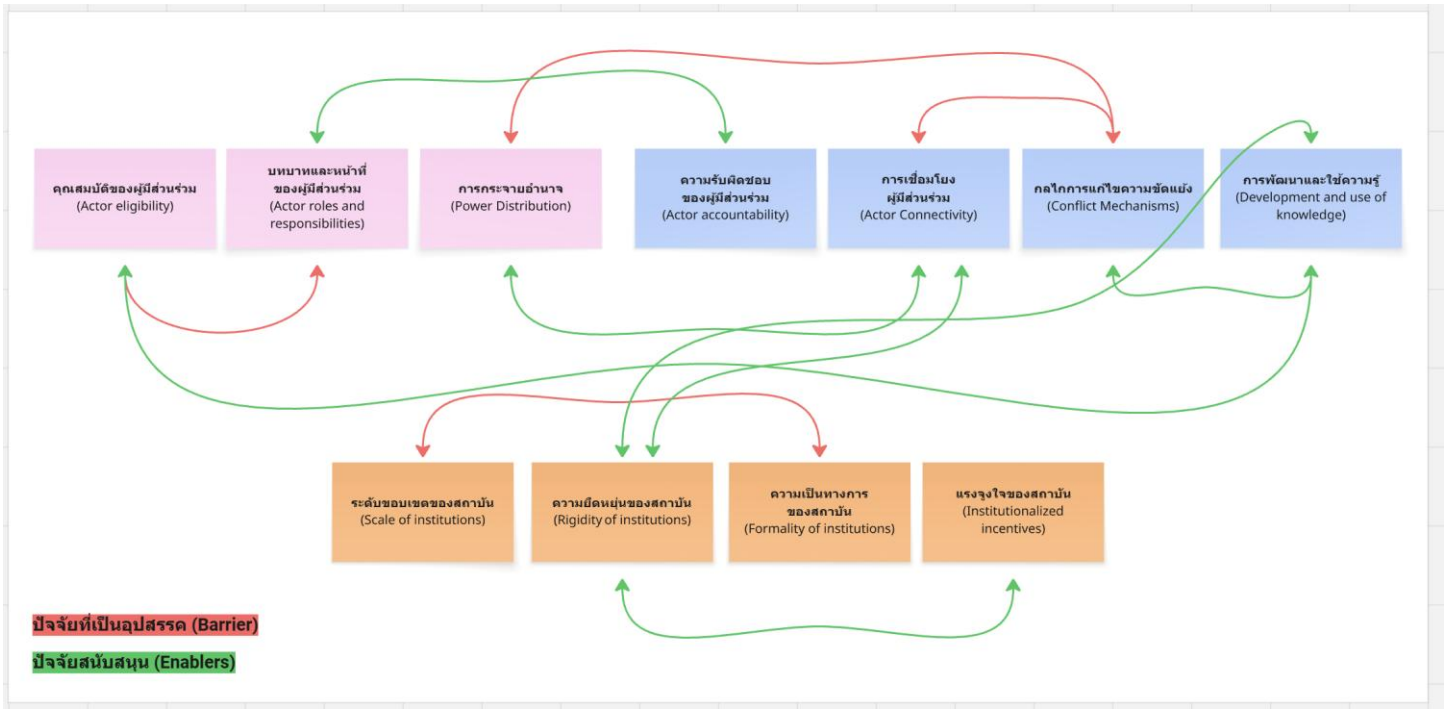


ปัจจัยที่เป็นอุปสรรค (Barrier)

ปัจจัยสนับสนุน (Enablers)

Results from the Expert Interviews


คุณสมบัติของผู้มีส่วนร่วม
(Actor eligibility)
บทบาทและหน้าที่
ของผู้มีส่วนร่วม
(Actor roles and
responsibilities)
การกระจายอำนาจ
(Power Distribution)
ความรับผิดชอบ
ของผู้มีส่วนร่วม
(Actor accountability)
การเชื่อมโยง
ผู้มีส่วนร่วม
(Actor Connectivity)
กลไกการแก้ไขความขัดแย้ง
(Conflict Mechanisms)
การพัฒนาและใช้ความรู้
(Development and use of
knowledge)
ระดับขอบเขตของสถาบัน
(Scale of institutions)
ความยืดหยุ่นของสถาบัน
(Rigidity of institutions)
ความเป็นทางการ
ของสถาบัน
(Formality of institutions)
แรงจูงใจของสถาบัน
(Institutionalized
incentives)
ปัจจัยที่เป็นอุปสรรค (Barrier)
ปัจจัยสนับสนุน (Enablers)


คุณสมบัติของผู้มีส่วนร่วม
(Actor eligibility)
บทบาทและหน้าที่
ของผู้มีส่วนร่วม
(Actor roles and
responsibilities)
การกระจายอำนาจ
(Power Distribution)
ความรับผิดชอบ
ของผู้มีส่วนร่วม
(Actor accountability)
การเชื่อมโยง
ผู้มีส่วนร่วม
(Actor Connectivity)
กลไกการแก้ไขความขัดแย้ง
(Conflict Mechanisms)
การพัฒนาและใช้ความรู้
(Development and use of
knowledge)
ระดับขอบเขตของสถาบัน
(Scale of institutions)
ความยืดหยุ่นของสถาบัน
(Rigidity of institutions)
ความเป็นทางการ
ของสถาบัน
(Formality of institutions)
แรงจูงใจของสถาบัน
(Institutionalized
incentives)
ปัจจัยที่เป็นอุปสรรค (Barrier)
ปัจจัยสนับสนุน (Enablers)