

Communicating Sustainability Through Technology with the Framing of CCS as an Economic Environmental Sustainability Effort by Indonesia's Maritime and Investment Ministry

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Abstrak

The impacts of climate change for several sector foster the sustainable mitigation approach. Carbon Capture Storage (CCS) as one of the technologies approaches meant to reduce emissions while supporting environmental conservation. This research identifies how the Coordinating Ministry for Maritime Affairs and Investment frames CCS within Indonesia's national climate change mitigation align with the public space for supporting national agenda. Framing theory is applied to understand the policy perspective of climate change and the government role. The framing theory is used to capture policy directions and communication strategies within implementation of CCS. This research using descriptive qualitative approach and in-depth interviews with key informants from government agencies, industry stakeholders and environmental organizations as secondary data to gain broader policy narrative regarding CCS. Selected articles are used to support the existing data and understand media representations taking movement whether it's aligned or diverge with the government's perspective. The findings show that the CCS is present as solution from Coordinating Ministry for Maritime Affairs and Investment to maintain economic and environmental goals. CSS also found as tools of Indonesia's commitments to climate change. However, the communication gap between several actor persist, give an impact to the public understanding of CSS purpose and the transparency information. Therefore, this research highlights the crucial role of policy actors in shaping CCS narratives and influencing public discourse in Indonesia.

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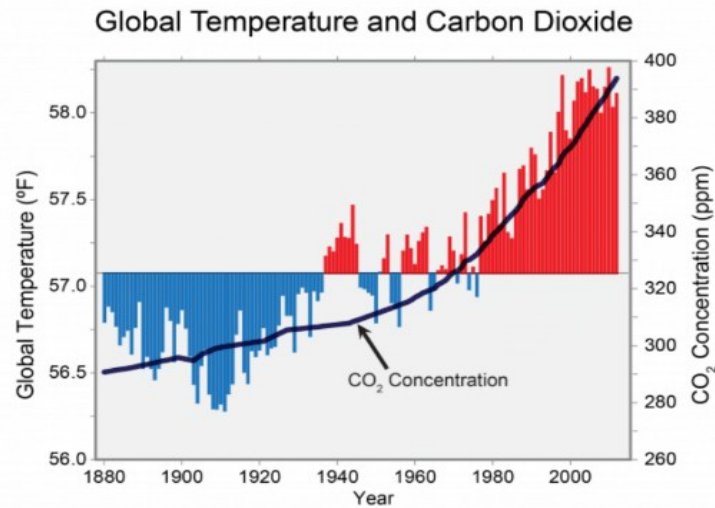
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1. Introduction

Indonesia is currently facing two challenges simultaneously; one is how to identify the adequate mitigation practice regarding extended extreme climate change, while the other one is how to bridge the gap between the complexity from the proposed technology and not only the comprehensiveness but also public acceptance in whole. These challenges are further emphasized by the fact that public awareness towards the cause and effects of climate change and its mitigation tools is still limited or even considerably very low (Turpyn & Adiwitya, 2021). **Figure 1** shows a strong correlation of the rise of carbon dioxide (CO₂) concentration in the atmosphere and the increase in global temperature. As the concentration of carbon dioxide (CO₂) in the atmosphere increases, so does the global temperature increases (Valentine, 2022).



Figure 1. Chart Showing the Correlation Between Carbon Dioxide Concentration Levels and Global Temperature Rise



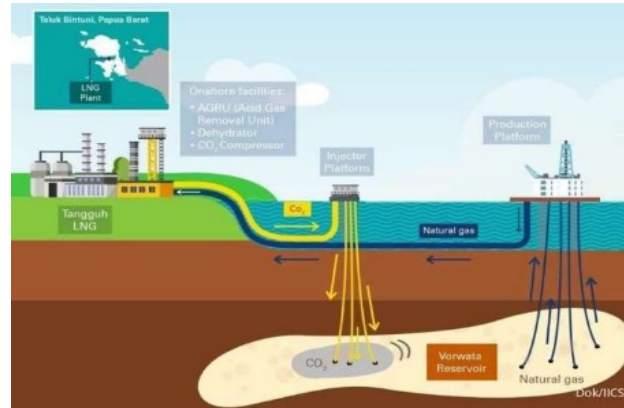
Source: *Scientifical evidence from the Intergovernmental Panel on Climate Change (IPCC)*

Since the late nineteenth century, the latest report from the Copernicus Climate Change Service (C3S)-European Union states shows the average global temperature has increased for at least 1.5°F and recent data shows that 2023 is by far the hottest year in history with an average global temperature of 14.98°C (Arif, 2024). Furthermore, this global trend has had visible impacts in Indonesia, including the more frequent and intense extreme heat phenomenon such as long droughts, hydrometeorological disasters and increasing food shortages (Rohman, 2024). The El Nino condition in 2023 made these conditions worse by disrupting agricultural production. As a result, it caused crop failures and rising food prices in several regions of Indonesia (Azizah, 2024).

Indonesia with the international community, has implemented various policies to address climate change which are including the managing of land use, shifting from non-renewable energy to low emission energy sources and improving transportation systems. In Indonesia, several efforts have been carried out to reduce deforestation and restore degraded land (REDD UNFCCC, 2022). In addition, Indonesia has introduced the National REDD+ (Reducing Emissions from Deforestation and Forest Degradation) programs, which focuses on restoring forests and peatlands to reduce emissions from land use. These actions are in line with global initiatives such as the UN-REDD programs, which shows that the action of deforestation can decrease when strong commitments, effective enforcement and transparent governance frameworks are established (UN-REDD, 2022).

Besides land use policies, the Indonesian government also promotes the use of electric vehicles (EVs) to achieve its sustainability goals. The government provides incentives such as VAT reductions, exemptions from luxury goods tax, import duty waivers and exemption from the odd-even license plate policy (Susetyo, 2025). This strategy is similar to Norway's approach where incentives such as tax exemptions and access to bus lanes helped increase EV sales to at least 70% in 2021 (Figenbaum, 2023). Although lots of mitigation efforts have been done, the successfulness of Indonesia's long-term climate targets are hindered by our heavy reliance on coal and other fossil fuels. As a result, Carbon Capture and Storage (CCS) has become an important technology for the industrial sector. Under the Paris Agreement and its Nationally Determined Contributions, Indonesia plans to cut greenhouse gas emissions by 29% on its own, or up to 41% with international help, by 2030. CCS is seen as a key technology for reducing emissions in sectors that are difficult to decarbonize (MoEF, 2021).

Figure 2. Illustration of the Carbon Capture and Separation Process



Source: (Kresnomurti, 2023)

Carbon Capture and Storage (CCS) is a technology designed to reduce carbon dioxide (CO₂) emissions released into the atmosphere from human activities. **Figure 2** shows, this technology focuses in capturing and separating CO₂ from the rest of the combustion gases, transporting them through pipelines and tankers and also storing them in a customized geological formation below the earth's crust to prevent the release of CO₂ into the earth's atmosphere (ESDM, 2009). As a mitigation effort, CCS will be introduced for sectors that are difficult to decarbonize, such as fossil fuel based energy production plants and heavy industries companies, making it look like a strategic option yet controversial in climate policy conferences (Asian Development Bank [ADB], 2025). Therefore, land-use policies, electric vehicles implementation, reforestation and similar actions are not sufficient to achieve long term climate goals, due to Indonesia's heavy reliance on coal and other fossil fuels energy. This situation has put Carbon Capture and Storage (CCS) in a critical position as topnotch technology within Indonesia's future climate strategy.

In Indonesia, CCS implementation are coordinated by the Coordinating Ministry for Maritime & Investment Affairs (Coordinating Ministry for Maritime Affairs and Investment) and supported by the other ministries, including the Minister of Energy and Mineral Resources and its regulatory framework; as mentioned in the Minister of Energy and Mineral Resources Regulation No. 2/2023, Financial Services Authority Regulation (POJK) No. 14/2023, and Presidential Regulation No. 14/2024 (BPK, 2021; BPK RI, 2023, 2024). Although these regulations indicate a strong government commitment, they have not been accompanied by effective and inclusive environmental communication. In practice, opposition expressed by environmental organizations toward CCS projects (CNN, 2023), together with the limited level of public knowledge regarding Carbon Capture and Storage (CCS) projects, indicates shortcomings in the environmental communication conducted by the Coordinating Ministry for Maritime Affairs and Investment (Coordinating Ministry for Maritime Affairs and Investment) in informing the public and environmental organizations in Indonesia about CCS projects.

A number of university students were selected to participate in the preliminary interviews for this study, to represent a relatively educated segment of the society with easy access to data and information. Based on the interviews, there is a particularly high level of unfamiliarity with CCS, in terms of its goals, workings and contribution to mitigate climate change. This lack of understanding is a real and serious concern given that CCS projects involves public funding (Umah, 2021) and are directly tied to the public's right to environmental information as stipulated in the Environmental Protection and Management Law (Law No. 32/2009). Non-linear understanding among stakeholders in efforts to reduce carbon emissions may hinder future public acceptance and support for CCS projects (Wahyudin, 2017). This condition proves the urgency to assess how the Government, particularly the Coordinating Ministry for Maritime Affairs and Investment (Kemenko Marves) in defining and communicating the climate change issue within its strategic communication.

In the Indonesian policy fields, CCS is not only positioned as a technical mitigation tool; but also as a strategic national resource that are hugely correlated to the constitutional, environmental and economical factors. Aside from that, the argument whether CCS needs more funding, poses a huge risk in its implementation; as well as, the potential of Indonesia's level in the world's hierarchy as a foreign carbon storage might have drawbacks environmentally, economically and governance if not closely supervised. The inconsistency in comprehension for all stakeholders involved like the public, government and environmental organizations indicates that the selection of the CCS project as a both solution and remedy needs further analysis to comprehend how the narration of climate change is built by Kemenko Marves. The inconsistency in perceptions among all parties involved like the public, government, and environmental organizations suggests that the selection of these CCS projects as a remedy to combat climate change necessitates deeper analysis and examination to understand how climate change narratives are constructed by Kemenko Marves. The most important thing in this situation is the way Kemenko Marves views and reacts to climate change challenges is largely explained by framing, which forms the basis for determining the course of policy; including the choice to promote CCS as a practical solution.

This condition shows that there is a gap in understanding how Indonesia framing Carbon Capture and Storage (CCS) not only as an environmental solution but also as an economic development instrument in national climate communication. In a situation of dependence on fossil fuels as well as the strong voice of civil society and differences in the level of climate awareness between regions, this study analyzes how the Coordinating Ministry for Maritime Affairs and Investment (Kemenko Marves) builds and communicates the CCS narrative in the context of Indonesia's climate change. Thus, this study seeks to fill the study gap that has been limited so far, especially in the context of Global South countries which have not been widely done, especially related to the implementation of CCS. So far, most previous research has focused more on public perception, trust and acceptance of CCS (Whitmarsh et al., 2019; Cologne & Siegrist, 2020; Fikru & Nguyen, 2024).

Most CCS communication studies are concentrated in Europe (Germany, UK, Denmark, Netherlands), North America (USA, Canada), Australia and China. Only a handful (Mulyasari et al., 2021; Ghazali & Zahid, 2018; Abdullah et al., 2021) explore Southeast Asia and even fewer that focus specifically on Indonesia's unique socio-political and cultural landscape. However, studies that specifically review how the government builds and communicates the CCS narrative are still relatively minimal. In addition, research examining the potential gap between government framing and framing carried out by environmental organizations and its implications for the legitimacy of CCS is also still poorly researched. Therefore, this study opens up space to explore framing led by government actors and assess the extent to which these narratives have an effect on the public and civil society organizations or actually cause friction. This is relevant in the Indonesian context, where climate policy communication is often dominated by an elitist approach rather than a participatory dialogue. Previous studies have mostly focused on the perception of risks and benefits, levels of trust and public acceptance of CCS at the local level (Arning et al., 2019; Pinata et al., 2021). Meanwhile, studies that explicitly place framing technology as a communication strategy for sustainability are still relatively limited. As a result, the framing of CCS as a solution that integrates economic and environmental dimensions both as an instrument for climate change mitigation and as a driver of green growth is still rarely explored in the literature. In fact, CCS in Indonesia is positioned not only as an effort to reduce carbon emissions but also as a strategy to strengthen national economic resilience and expand green investment portfolios.

In the context of rejections from environmental organizations both profit nor non-profits, as well as the low level of public awareness towards the CCS programme, analysis regarding how Kemenko Marves frames the climate change issues and CCS becoming crucial on how to find the main bottleneck in the communication that potentially leads to the obstruction of public support. The framing approach drives studies to compartmentalize perspectives to shows which perspectives dominates the official narratives, which perspectives get outcasted and which perspective shows joint legitimacy. Several studies including one conducted in 2018 highlighted a minor segment of the public is aware about the Carbon Capture and Storage (CCS) Chazali & Zahid, 2018; Große-Kreul et al., 2024).

Despite that, scientific evidence that specifically discusses the interactions between government narratives, civil society organizations and the public understanding is still relatively low. Within the Indonesian context, environmental



organizations often express oppositions toward the CCS programme bringing the arguments that this particular technology has the potential to prolonged the overdependency of fossil fuels. On the contrary, governments deliberately frames CCS as a part of energy transformation that is inevitable by nature. Based on this gap, this research tries to provide an in-depth analysis of the communication context dynamics that is non-linear and to show how misaligned narrative might create "*kesenjangan komunikasi*" that eventually will lead to limit public support.

That reflects the importance of environmental communication in ensuring alignment of understanding between government, environmental actors, and society, as emphasized by Wahyudin (2017), where effective communication plays a key role in building public awareness and collective responses to environmental issues. Furthermore, environmental communication also functions as a strategic approach to enhance public understanding and encourage participation in environmental issues, as highlighted by Aldino et al. (2020). In this context, framing analysis backed with the environmental communication becomes essential to examine how different actors construct and communicate CCS narratives, which in turn influences public perception, inclusion, and the effectiveness of communication in addressing climate change issues.

2. Methods

This study employs a qualitative descriptive approach within a constructivist paradigm. This paradigm is used to understand how social reality, particularly issues related to climate change and Carbon Capture and Storage (CCS), is constructed through communication processes. In this research, public communication is understood as a process of meaning construction rather than merely the transmission of information (Eriyanto, 2015). A qualitative approach is chosen because the study focuses on how the Coordinating Ministry for Maritime Affairs and Investment (Kemenko Marves) frames and communicates the issue of Carbon Capture and Storage (CCS). The study is descriptive in nature and does not aim to identify causal relationships, but rather to describe the narratives and communication strategies employed (Nassaji, 2015).

The research data consist of primary and secondary data. Primary data were obtained through semi-structured in-depth interviews and news analysis. The interviews were conducted using open-ended questions and continued until the data were considered sufficient (Darmawan, 2021). The informants selected in this research were chosen by using purposive sampling and have contribution to the CCS project in Indonesia, including: Rizky Muhammad Kahfie who is representing government perspective as a Deputy for Coordination of Maritime Sovereignty and Energy at Kemenko Marves; Bondan Andriyanu who is providing an environmental organization's perspective as an air pollution campaigner from Greenpeace Indonesia; Diofanny Swandrina Putri who is representing the industry perspective as a Director of Indonesia and Regional CCS Strategic Initiative; and Ananda Setiyo Ivannanto who is offering insights from the private sector as a President Director of PT Awina Sinergi Internasional. Furthermore, in this research also analyzed narratives from several online news media article which were taken from detik.finance, Kompas.com and one official press release from Kemnko Marves published between January and August 2024. The purpose of analyzing this narratives is to explore more on how CCS is framed and communicated to the public.

This research used framing analysis to examine how Carbon Capture and Storage (CCS) is communicated. According to Matthes (2011, as cited in König, 2019), framing operates at three levels: communicator, message, and receiver. Meanwhile, in this research focuses on the communicator and message levels, particularly on how Kemenko Marves constructs and delivers the CCS communication. The analysis uses Entman's (1993) framing model which consists of four elements: define problems, diagnose causes, make moral judgments and treatment recommendations (Eriyanto, 2015, p. 223). In addition, this research also used an environmental communication perspective (Cox & Pezzullo, 2018), focusing on two key areas: public engagement and risk communication, to understand how CCS is communicated in relation to public involvement and environmental risks.

3. Result and Discussion

This research not only analyses interviews with several key stakeholders but also analyses several online news articles in order to investigates on how the Carbon Capture and storage is communicated and framed in Indonesia. The result show that CCS is not only promoted as a solution which can reduce carbon emission but also seen as a way to support

long term economic growth and improve the industry in Indonesia's climate change policy agenda. Government actors especially the Coordinating Ministry for Maritime Affairs and Investment together with a community of technical experts represented by the Indonesia CCS Center (ICCSC), crafted a predominantly optimistic narrative that positions CCS as inevitable and necessary to achieve national sustainability targets. In this framing, technological progress and economic sustainability are emphasized, while long-term uncertainty and risks are largely underestimated.

Different from government institutions and ICCSC views, environmental organization and independent experts believe that counter-framing coming side by side with challenges dominant narratives which questioned the effectiveness of CCS in reducing emission, potential environmental risks and the possibility of CCS prolong the dependency on fossil fuels rather than contribute as an actual energy transition. These actors highlight the concern about accountability, transparency and the effect of environmental risks especially in the absence of public engagement and a clear regulatory framework of CCS in Indonesia. These contradictory arguments reveals CCS as a debatable climate solution which is located at the intersection of climate governance, economic ambition and public trust. Rather than showing same shared policy agreement, CCS became a space that trigger the discursive contestation, where power, expertise, and legitimacy were actively negotiated.

3.1 Results

Tabel 1. Three media coverage news of CCS in Indonesia

No	Media	Date	Title
1	Press Release Kemenko Marves	31 January 2024	Kemenko Marves Voices CCS as a Key Transition Technology Solution to Accelerate Indonesia's Decarbonization
2	Kompas.com	29 June 2024	BPH Migas Committee Member Acknowledges CCS Will Extend Fossil Energy
3	Detikfinance	30 July 2024	Luhut Reveals 2 Carbon Capture Technology Projects That Could Boost Oil and Gas Production

Source: Author's analysis (2025)

Analysis of three news

Tabel 1 shows the media chosen as the analysis material is Kompas.com and Detik.com because of their dominant position as Indonesia's digital news ecosystem, as reported by Databoks (2024) both of media are included as the most frequently accessed media articles nationally that has high level of readership across various demographic groups. Both of articles have a wide audience and strong influence in public discussion. Because of their position as a mainstream media, they have played an important role in shaping on how national policy issues are understood, including climate change mitigation solutions such as Carbon Capture and Storage (CCS). As a result, the content published by these platforms not only reflects the mainstream media perspective but also plays an important role in building on how reinforcing and normalizing certain interpretations of CCS for the public. The use of news articles from Kompas.com and Detik.com allowed this research to understand on how CCS is framed in mainstream journalism, where policy information is explained into narratives that are easier for public to follow. The platform often cites government officials, industry representatives and experts which makes it an important bridge between policymakers and the public. By analyzing media content, showed how official statements are highlighted, explained in simple terms or simplified as well as how potential risk, uncertainties and differing viewpoints are either included or ignored.



Concurrently, Coordinating Ministry for Maritime Affairs and Investment (Coordinating Ministry for Maritime Affairs and Investment) press release was included in this research to represent the government's official narrative, this is due to the characteristics of press releases which are generally more formally explain state priorities, policy justifications and strategic frameworks. Unlike journalistic reports, the content from press releases tend to provide direct insight into how government seeks to define problems, assign responsibility and present CCS as a climate solution. Therefore, combining mainstream online news media and official government press releases can strengthens the quality of analysis this research by allowing a systematic comparison between mediated framing and institutional framing of CCS. As a result, this approach makes it possible to identify areas of convergence, divergence, and tension between popular media narratives and state-led communication that can show how CCS discourse is shaped or reinforced within Indonesia's contemporary media landscape.

Table 2. Results of Online News Framing and Environmental Communication Analysis

Source	Framing				Environmental Communication	
	Problem Definition	Diagnose Courses	Make Moral Judgement	Treatment Recommendation	Public Involvement	Risk Communication
Kemenko Marves Press Release (31 Jan 2024)	Urgent need to reduce emissions to accelerate decarbonization	Industrial and energy activities	Optimism and responsibility to act	CCS as a key strategy for NZE 2060	One-way, no consultation	Risks not disclosed, only benefits emphasized
Kompas.com (29 Jun 2024)	Difficulty in moving away from fossil energy	Continued reliance on oil and gas	Caution, skepticism about technology	CCS should be evaluated critically, not the only solution	No public involvement discussed	Risk partly shown (fossil dependency), broader risks absent
Detikfinance (30 Jul 2024)	Balancing emission reduction with energy demand	Challenge of industrial growth vs. environmental commitments	Strong optimism, CCS for national interest	CCS should be implemented as it is framed to simultaneously reduce emissions and enhance oil and gas production	No public involvement discussed	Risks ignored, focus on economic opportunity

Source: Author's analysis (2025)

Analysis Comparative Framing Analysis of CCS Communication: Government vs Media Perspectives

The comparison among the three news sources shows similarity but interconnected in a way of presenting the issue. Carbon Capture and Storage (CCS) is mostly described as a technological and economic solution for Indonesia's climate change strategies. In all sources, CCS is presented as response to reduce emissions while still supporting long-term industrial and energy development. However, the way these two roles are explained is different among government and mainstream media. These differences can be seen in how the narrative define the issues, moral evaluation, treatment recommendations and environmental communication concerns. A press release from the Coordinating Ministry for Maritime Affairs describes climate change as an urgent problem that requires faster

decarbonization action which mainly links the causes of climate change to industrial and energy activities. In this framing theory analysis showed that CCS was presented as the key strategy to reach the Net zero emission (NZE) in 2060. This narrative highlights optimism, technological responsibility and national commitment, positioning CCS as a rational and forward-looking policy choice. However, this framing is mostly one-way communication approach with a few public involvement and limited communication about the risk associated with the CCS project. In contrast, only some of the potential benefits are highlighted so it can create a sense of certainty and control while minimizing uncertainty and controversy.

Media Framing Analysis of CCS in Kompas.com: Between Energy Transition Challenges and Policy Skepticism

In another hand, Kompas.com show in their narrative a more careful framing by defining climate issue in terms of the difficulties of switching away from fossil fuels. CCS is discussed in a broader energy transition dilemma, where continued dependence on oil and gas is described as a structural challenge. The moral judgment in this media reporting shows skepticism and caution, especially about the risk that Carbon Capture and Storage (CCS) could extend the use of fossil fuels. Therefore, from the treatment recommendations perspective suggest that CCS should be carefully and critically assessed rather than positioned as the only final solution. Even though the article takes a more critical position, it does not explicitly discuss about public participation, nor does it fully explain the wider environmental, social or governance risks apart from the concern about continued fossil fuel dependence.

Detikfinance Framing of CCS: Economic Priorities and Limited Risk Communication

Detikfinance mostly reinforces the government's optimistic framing but it focuses strongly on economic aspects. The problem is defined as the need to balance the reduction of carbon emission with increasing energy demand and industrial growth. CCS is described as a technological solution that has capability to reduce emissions while also supporting oil and gas production. In this way, environmental goals are linked with national economic interests. The moral evaluation highlighted optimism and national benefits, presented CCS as a strategic asset instead of a debated technology. Similar to government press release, this reporting does not include the discussion about public participation and lack of risk communication, instead it focuses on economic opportunities and investment potential. Overall, the findings describe that CCS is mainly framed as a necessary and useful technological pathway, supported by state-oriented and economically focused media narratives, while critical perspectives appear limited and fragmented. The lack of deeper discussion about public engagement and comprehensive risk communication across all sources shows a broader communication gap. These gaps reduce opportunities for inclusive dialogue and strengthen a top-down communication model, driven by experts and authorities that tend to prioritize economic and technological goals over public participation and transparency. As a result, CCS appears not only as a technical climate solution but also as a subject of debate, where its legitimacy depends on how risk, responsibility and public aspirations are included or excluded in the Indonesia media landscape.

3.2 Analysis of Interview Results on CCS Communication

Government Framing of CCS: Between Technological Optimism, Economic Priorities and Limited Public Participation

From the interview findings reveal differences in how Carbon Capture and Storage (CCS) is framed and communicated by different stakeholder groups in Indonesia which reflecting the tensions between climate policy, economic priorities and community legitimacy. This variation can be seen in all framing elements, including problem definition, causal diagnosis, moral evaluation and treatment recommendations as well as in approaches to public engagement and risk communication. The government official from the Coordinating Ministry for Maritime Affairs defined climate change as an urgent emissions problem that must be solved without harming economic growth. In this view, the causes of the problem is attributed to human activities such as industrial production, transportation and deforestation. CCS is morally evaluated as a technological that can responsible and rational technological solution which can balance reconciling environmental goals and economic sustainability. For this reason and views on related issue, CCS is positioned as a key strategy to help Indonesia reach the commitment of Net Zero Emission 2060 target.



However, this framing is communicated through a dominated top-down approach with limited focus on public participation or open dialogue. The risks related to CCS are not discussed in detail, instead the communication emphasizes opportunities, technological progress and national benefits. This suggest an implicit assumption that expert-driven solutions are sufficient to gain public acceptance.

Table 3. Results of Interview Analysis on CCS Communication

Informant	Framing				Environmental Communication	
	Problem Definition	Diagnose Courses	Make Moral Judgement	Treatment Recommendation	Public Involvement	Risk Communication
Government Official (Deputy for Maritime and Energy Sovereignty, Kemenko Marves)	Urgent need to reduce emissions while sustaining economic growth	Human activities such as industry, transportation, deforestation	Optimism that technology can solve climate challenges	CCS as a central strategy to achieve NZE 2060	Communication was top-down, no emphasis on public engagement	Risks not discussed, focus only on opportunities
NGO Representative (Greenpeace Campaigner)	Climate crisis rooted in fossil fuel dependence and exploitative systems	Structural reliance on fossil fuels and unsustainable economy	Skepticism toward CCS; unfair to society if risks hidden	Prioritize natural climate solutions (e.g., forest conservation) over CCS	Stressed absence of public participation and FPIC	Criticized lack of transparency; warned of leakage and high costs
Community of Experts (Director of Indonesia & Regional CCS Strategic Initiative)	Challenge of reducing emissions while maintaining investment and competitiveness	Need for technological solutions and global partnerships	Confidence in CCS as a path for Indonesia's leadership	Accelerate CCS with strong regulation and international cooperation	No attention to community involvement	Risks overlooked; communication centered on economic potential
Private-Sector Expert (President Director of PT Awina Sinergi Internasional)	Lack of transparency and limited public understanding of CCS	Poor communication and one-way information flow	Fairness and accountability should guide implementation	Improve transparency and public education before expanding CCS	Highlighted the need for inclusion of citizens	Pointed out that risks were not communicated, creating potential for public rejection

Source: Author's analysis (2025)

NGO Framing of CCS: Between Structural Critique and Social Justice

In contrast, NGO representatives present a fundamentally different framing that views climate change as part of a larger structural problem related to fossil fuel dependence and unfair economic systems. From this perspective, CCS is not seen as a neutral technological improvement but as a solution that may continue unsustainable energy practices. The moral judgments shows skepticism and concern for social justice. NGOs argue that the costs and risks of CCS are often passed on to society, instead being mostly examined by the industries responsible. As a result, this group recommend natural climate solutions such as forest protection and ecosystem restoration rather than “techno-solutionism”. This perspective also strongly emphasizes the lack of public participation including the absence of Free, Prior and Informed Consent (FPIC). NGOs criticize the limited transparency regarding the risk, costs and possible environmental impacts of CCS.

ICCSK Framing of CCS: Between Technocratic Solutions, Investment Interests and Limited Risk Communication

From the expert community, represented by Indonesia Carbon Capture and Storage Centre, presents a more technocratic framing that highlights national opportunities and strategic positioning. Climate change is described as the challenge that require action on reducing carbon emissions but also can maintain the investment and economic competitiveness. CCS is morally evaluated with confidence and is framed as a strategic opportunity for Indonesia to show leadership in climate technology and attract international investment. The recommended action is to accelerate the development of CCS through stronger regulations and international cooperation. However, similar to the government’s perspectives, this framing has lack of community participation or inclusive communication. Risks are not fully recognized and mostly presented as manageable technical problems. As a result, the discussion of risk communication becomes limited and narrow.

Private Sector Perspectives on CCS: Emphasizing Governance, Transparency, and Public Legitimacy

In another hand, private sector experts present a more reflective and critical view that connects technological optimism with concerns about governance and public legitimacy. Climate change is discussed alongside with the limited of transparency and low public understanding of CCS which is seen as a major obstacle to its implementation. The moral evaluation highlights the importance of fairness, accountability and social responsibility of policymakers and project implementers. From this point of view, CCS should not be developed further without improving communication practices, especially through public education, inclusive participation and more comprehensive risk information. In case, the issues are not properly addressed it may increase the risk of public resistance and weaken the long -term success of the CCS initiative.

Overall, the interview findings show that communication about CCS project in Indonesia is fragmented and often conflicting framing. While government and expert narratives focus on technological optimism and economic opportunities, NGOs and private sector actors highlight concerns about transparency, public participation and the fair distribution of risks information. This fragmentation in framing shows clear communication gaps that reduce mutual understanding and weaken the social legitimacy of CCS as climate solution, resulting the need for more inclusive and dialog based environmental communication strategy. An inclusive environmental communication strategy needs to integrate technological developments with social concern, especially when climate policy is shaped by economic and political priorities.

3.3 Discussion

Government Framing of CCS

The highlight from the discussion is that Carbon Capture and Storage (CCS) has two main interconnected objectives, it is showed as the result of how the Coordinating Ministry for Maritime Affairs and Investment (Kemendagri) positioning CCS as the response toward climate change and presented as a technology that support economic growth and national competitiveness. The government state that CCS is not treated one side as a technical mechanism for emissions decrease but also as a strategic tool that can attract investment, help industrial continuity, and strengthen



Indonesia's contribution especially in technological growth during the energy improvement. Through aligning both priorities in environmental and economic framework, the government gain official discourse to legitimizes CCS as future-oriented solution without altering the national development agenda.

The framing holds techno and economic demonstrates expanded policy orientation, rather to restricted the development it become an opportunity for the government. CCS framed as legitimate reasons to continuing industrial and infrastructure operation while adjusting the climate mitigation principal. As the result, the normalization of fossil fuel-bases industries relies on framing role and sadly be the black point to reduce tension toward environmental protection. This case of technological and economic feasibility rising the limit for public discussion as the representative social and environmental part, it is also be the basic less concern to receive the participate for government.

These findings are align with earlier research which argue that framing CCS by the right narratives of green growth and circular economy insight can increase its public and political acceptability, particularly from the technology side when it is associated with innovation and economic resilience (Whitmarsh, Xenias, & Jones, 2019; Donnison et al., 2023). The same view was shared by the previous one about growing skepticism in perceiving CCS as reinforcing risky industrial practices or prolonging dependence on fossil fuels. Another highlight is the dual-purpose framing might strengthen the policy within economic and technical while carried out the fall of public trust if the risk, accountability, and long-term sustainability are not discussed openly. The best way to gain public trust depends on the effectiveness CCS communication which the narrative construction should open and inclusive.

NGO Perspectives and Criticism

The classic communication way remains, the government tends to selective the CCS framing only from the benefits projected such as emissions reduction, investment opportunities, and technological progress. Despite the discussions which has the same important role is left unexplored, such as potential risks, costs, and long-term uncertainties continue to be limited. This pattern impact the simultaneously narrows public deliberation because communication emerges as legitimation strategy to define which aspects of climate innovation should occur. Arning et al. (2019), state that the same situation found in Germany of policymaker strategy to highlight dominantly to positive attributes rather than transparently the risk-related concerns, this strategy ultimately contributed to declining public trust and growing societal resistance.

The limited discussion of CCS risk invited criticism comes from environmental organizations, particularly Greenpeace. Greenpeace reveals the extending CCS risk relies on fossil fuels rather than structural industries transition toward low-carbon energy systems. Their critique includes economic and political concerns not limited in environmental considerations, and prioritized public and policy movement should more focus on forest protection, ecosystem restoration, and community-based mitigation efforts rather than divert and move away from what it should be prioritized. Greenpeace argue on broader impact of CCS, when it is promoted but put aside the critical engagement may be used to delay change that preserves extractive industry interests under the banner of climate action.

Cologna and Siegrist (2020) share the same opinion which the foundation of public trust in CCS is transparency, procedural fairness, and acknowledgement of uncertainty. The case is government tend to implement the old-way communication which avoids discussion of risks, uneven impacts, or ethical considerations, turn out the public trust is likely to weaken regardless of the technology's mitigation potential. In this sense, CCS hard to perceived as a technical matter only instead should be viewed as a political and communicative process. The absence of balanced narrative and honest explanation of risk and uncertainties seems overly optimistic, which cause public skepticism and undermine policy legitimacy.

The gap between government and NGO perspectives demonstrates a fundamental tension in CCS communication in Indonesia. The government presents CCS as a modern and promising solution that fits national development goals. On the other, environmental organizations express structural concerns about fossil fuel dependence, high costs, and unequal distributed social and environmental impacts. From the NGO perspective, CCS become part of political choice which contribute to shifting risks more highly toward communities while supporting industry interests. Similar

situation has occurred in other places. Ghazali and Zahid (2018), state that even by the supporting institutional if the transparency is limited and lack of public trust reduce social acceptance of CCS.

These competing perspectives offer huge impact in Indonesia, where environmental NGOs take an important role in shaping public discourse and mediating public trust in government climate program. NGOs as a representative counter-narrative actors by questioning official framings and introducing ethical, social, and ecological issues that are often absent from official communication. As a result, NGOs voices not only challenges governmental technological optimism, but also influences public concerns regarding accountability, justice, and long-term sustainability. The coexistence of these different views produces a fragmented public discourse, where CCS is both promoted as a climate solution and criticized as a mechanism for maintaining carbon dependent development.

Public Engagement and Strategic Roles of CCS

Another important finding of this study is the consistently low level of public awareness about CCS. The low awareness happens even among highly educated urban youth who have broad access to digital information and media digital discussions in climate change topic, it is an evidence of the limited knowledge about CCS policy and the gap in public understanding, but it can be improved through public participatory and two-way communication strategy. CCS communication in Indonesia still reliance on one-way channels such as press releases, policy statements, and elite-oriented media has been proven not sufficient to increase public awareness or meaningful engagement. Mulyasari et al. (2021) note that the success of CCS and CCUS projects in Indonesia depends greatly on public participation. Two-way communication can grow from local media, trusted community leaders, and communication local culture-oriented. The limited of these approaches cause CCS persist seen as elite-driven plan rather than a solution created hand in hand with the society. Over time, this communication gap may deepen skepticism and weaken long-term social acceptance, regardless of technical feasibility or policy endorsement.

This research reveals beyond the environmental communication lens, it is found that CCS often framed as an economic and diplomatic tool. The experts and private sector interviews state that CCS positioned as tool to attract foreign investment, improve technological capacity, and expanding the competitiveness of low-carbon economy. In other words, CCS plays role as strategic asset to maintain Indonesia position in global energy market while promote the commitment of international climate agenda. The CCS positioned reflects the trend in international interest which transitional technology for fossil fuel dependent the economic navigate to climate governance demands. This perspective aligns with the findings of Verbeke, Osiyevskyy, and Backman (2017), that CCS adoption in industrial sectors is often driven by considerations of the competitiveness, access to capital, and regulatory support rather than just environmental motivations. In Indonesia, CCS is often discussed side by side with a development discourse that emphasizes economic resilience, industrial continuity, and strategic global positioning. Consequently, it is tied closely to diplomatic ambitions, including strengthening Indonesia's role in international climate negotiations and shaping the country as a pragmatic yet forward-looking actor within the Global South.

Policy Communication Challenges and Implications

The CCS framing mostly through economic and diplomatic narratives makes the public questions the democratic accountability. The framing of climate technologies value happens to discussed mainly through competitiveness and investment, while actually the undeniable side should get the same stage remain undiscussed such as social and environmental concerns seen only get the second role within national agendas. This imbalance framing of CCS fuels skepticism especially for civil society who perceive CCS agenda as a framework to prolong fossil fuel reliance while appearing climate-friendly. Even though the economic and diplomatic framing invites international advantages, still the complete framing through responsive domestic communication is needed to engages directly with public concerns. In this regard, effective environmental communication becomes essential in bridging this gap. Assegaf, Faizin, and Tandio (2022) argue that environmental communication should not only aim to persuade but also to foster tangible and sustainable social change. In other words, the climate framing communication should include its structural drivers, uneven impacts, and the ethical dimensions of different policy choices to become effective framework for both side,



government and society. The process of framing practices, start from defining the problem to evaluating its broader implications, it may be more robust with public support by engagement and participatory risk communication.

Transparent discussions about uncertainty, costs, and long-term risks enable a wide range of actors to critically examine CCS in relation to other mitigation options, encouraging informed decision-making instead of passive acceptance. This approach become the key to building shared belief between government, society, and international partners that social legitimacy and stakeholder participation as essential for climate cooperation and funding. When environmental, economic, and diplomatic narratives are connected, CCS can be framed as part of a wider and more socially grounded climate strategy. Without this framework and the balance efforts, CCS may persist viewed as government technocratic initiative, eroding public trust and reducing the credibility of Indonesia's climate policy.

4. Conclusion

This research concludes that through CCS there are two key interest prioritized by the Coordinating Ministry for Maritime Affairs and Investment (Kemenko Marves), including economic growth aspect and climate change commitment. CCS is framed as vital policy to present Indonesia commitment for fossil fuel dependence and caring climate issue, aligned with the Net Zero Emission target by 2060. Trough the narrative the government legitimized CCS not only part of green development but also reveals the innovation, competitiveness, and global leadership for long-term framework. However, this study show the disintegration of CCS framing between government, environmental organizations and the public view. The government points out the economic potential, long-term environmental risk, along with the challenges and the uncertainty, but tends to get less view from the public. The public selective communication style contribute to the rise of skepticism toward CCS and undermines the public trust instead the public views CCS as innovation driven by government interest. The pain point of the CSS agenda such as the risk, does not inform to the public in transparent and lack of public engagement becomes the main reasons of the public understanding gap and weakens social acceptances. It is reveals that the CCS agenda still based on the policy communication agenda which relies on one-way communication instead of encourage public participation. This information dissemination situation leads to the low of public awareness even though in urban communities, indicates that it is not sufficient enough to build deep public understanding.

The dominance of economic and technological framing over social and ethical considerations also shows how policy narratives can put aside alternative mitigation pathways and narrow the critical voices space, even though these perspectives are relatable to long-term sustainability. By integrating policy framing analysis, perspective of environmental and risk communication helped this study to reveals the performance of CCS as a climate policy instrument could not be inseparable from the communicative process which justified and debated. The role of Coordinating Ministry for Maritime Affairs in communication not only shapes the perception of CCS instead affect whose interests are prioritized and whose concerns are excluded. Such an irony, the execution of CCS Indonesia only politically appealing but socially widely debated, reflecting from previous sense which impact a broader tension between development imperatives, environmental responsibility, and public trust. In future condition, CCS should be framed towards inclusivity, transparency, and reflexivity according to the consequence in this era. Economic and technological optimism only should not become the reliance through explicitly acknowledge and the uncertainties, risks, and trade-offs associated with CCS. Addressing these dimensions, public suggestion hold power to strengthen credibility, reduce resistance by signaling fairness and accountability, which are important determinants of public trust in complex climate technologies.

In addition, the need for public involvement is vital to allow the rising awareness among civilian that go two-way communication, and not based on top-down information sharing, so the CCS growth perceived actively in public hand. The transition in CCS framing from government dominance to embedded and deliberative purpose could be start in transparency public involvement allowing the participation comes from local communities, organization, including independent experts in environment issue. The diverse perspectives could strengthen the long-term legitimacy should be the main focus because it is contribute to the policy development and reducing the tensions between government and public. Institutional perspective argue that the economic-focused framing of CCS presents both opportunities and vulnerabilities. The advantage from linking CCS to investment, industrial competitiveness, and international

diplomacy are the outcome of the soft power for Indonesia's to strengthen the strategic position. However, focusing too much on this advantage side only can lead to concerns about continued reliance on fossil fuels and accusations of greenwashing, especially if it is followed by unstable commitments toward a broader energy transition effect.

Therefore, public support are essential for strategy in balancing the economic ambitions followed by credible environmental protection driven by participatory governance to gain long-term vision. The findings of this research emphasize that two main element of framing theory should be integrated into climate policy design from the outset, rather than treated as supplementary elements regarding technical decisions from the unchangeable policy. The CCS framing should structure with a clear and shared understanding of the climate problem, transparent causal explanations and clearly stating considerate the policy decisions. The government should realize that inclusive public engagement and communication strategies are sensitive to social and cultural contexts, therefore can foster shared understanding among the public, and international stakeholders. Future research can filled and examine the practical communication models and governance framework in more boarder element which allow emerging CCS as climate technologies to be discussed in technical solutions, and more in socially legitimate pathways toward sustainability that are perceived as collectively owned.

5. Recommendation

- Kemenko Marves should build a platform that can be used as a tool to implement the two-way communication by organizing regular public consultation, stakeholder forums and interactive digital discussion (such as webinars and all kinds of social media engagement) in order to facilitate dialogue between the government, environmental organizations and the public.
- Kemenko Marves and related ministries (e.g., Ministry of Energy and Mineral Resources) should implement transparent risk communication strategies by publishing accessible reports, infographics and public briefings that can be explained about the environmental risk, uncertainties and policy consideration.
- Kemenko Marves in coordination with the Ministry of Energy and Mineral Resources should guide multi-stakeholder to involve in CCS policymaking including environmental NGOs, local communities, and independent experts in policy discussions, consultation processes, and evaluation mechanisms.\
- Kemenko Marves should balance CCS policy narratives by ensuring that communication materials equally address economic benefits, environmental impacts and social implications in order to prevent perceptions of bias or greenwashing.

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