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Institutionalism to Drive Source of Financing for Municipal Solid Waste Management Acceleration in Indonesia

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Abstract

Purpose – Waste becomes a major problem when improperly managed. In Indonesia, one solution that is being discussed is to convert the waste to electrical energy. This study is expected to comprehend potential institutionalization engagement among relevant stakeholders to support the Waste to Energy project acceleration.

Methodology – In-depth interview was conducted to explore the topic, while qualitative data were coded under institutionalism factors and analyzed using an interpretive method with QDAS – Nvivo.

Findings – The results showed policy-making ideas on WtE were primarily influenced by mimetic and coercive institutionalism factors, which had the strongest correlation. This was followed by the correlations between normative and mimetic, as well as normative and coercive. Moreover, the study showed the importance of expanding financing paradigm for WtE projects toward non-budgetary sources, which could accelerate development across the country.

Originality – Several studies have explored the potential and development of WtE in Indonesia, but only a few have addressed alternative financing sources and fiscal aspects. The current study explored institutionalism from the perspective of Indonesian stakeholders.

1. Introduction

Increased consumption leads to a higher waste production, which is an inevitable outcome. This issue has serious consequences globally, even in developed countries. In the US, only 13 percent of solid waste is used for energy recovery, while 53 percent is landfilled. Previous studies have shown that the adoption of Waste-to-Energy (WtE) technology might continue to expand, although slowly, specifically in coastal and urban areas lacking suitable land for new landfills. Long-term success in the US is possible with a system that integrates recycling, wastewater treatment infrastructure, emission reduction, job reduction, and profitability (Mukherjee et al., 2020). However, developing countries face the challenge of using municipal solid waste (MSW) resources far less efficiently than developed countries, mostly in Asia (Le et al., 2023; Khan et al., 2022) and Africa (Hachemi et al., 2024). The root of the problem is to choose the waste to energy

technology option, its relation with financing and achievement of the program outcome (air or land pollution as side impact) (Farooq et al., 2024). China is experiencing rapid urbanization and industrialization, both of which demand a substantial energy supply (Lin & Zhang, 2024). The efforts of China to transform waste into energy have faced various challenges, such as high costs, difficult commercialization, complex processes, community opposition, technical issues, legislation, and regulation (Awasthi et al., 2022). Moreover, a consistent theme in these investigations is the significant expense to address the MSW problem. Studies in India, Pakistan, and Malaysia showed that building a sustainable business model entailed the participation of various regional players, including the local governments, the private sector, and the community (Kumar et al., 2024;Iqbal et al., 2023; Ratnasari et al., 2023; Prabawati et al., 2023; Jabeen et al., 2022; Tang et al., 2021; Priti & Mandal, 2019).

Waste is a significant challenge in Indonesia, and waste stockpiles have reached 67.8 million tons in 2020 (Zeng et al., 2024; Silintowe & Sukresna, 2022), placing the country among the top five annual generators of MSW. The number is anticipated to reach about 3.4 billion by 2050 as long as no extraordinary policies or efforts are implemented (Raja, 2022). Waste management directly affects the environment (Shodiq et al., 2023). Currently, open dumping and sanitary landfills are the predominant waste management methods in most of Indonesia's urban areas. These methods have several challenges in terms of cost, location, and environmental impact. According to the Ministry of Environment and Forestry, food waste accounts for the largest portion of total waste in Indonesia, making up 40.3% of the total. This is followed by plastics at 17.1%, wood at 14.1%, paper at 11.9%, and other materials. This type of waste can decompose into methane and other greenhouse gases, contributing to the greenhouse effect. Even though the greenhouse effect at normal levels is necessary to keep the Earth warm enough for life, the recent intensification has the potential for more negative impacts. Therefore, improving waste management is crucial to mitigate and adapt to global climate change due to these dangerous effects (Cahyani et al., 2022;Latanna et al., 2023;Ismiraj et al., 2023).

The government has a responsibility to provide proper and adequate waste management infrastructure. The increasing volume of waste and rapid economic growth, specifically in big cities, need an advanced and integrated waste management system. Since 2015 the government has encouraged the use of thermal technology for waste management, specifically Waste-to-Energy (WtE) power plant. To accelerate the transition of waste processing from the old paradigm to the use of thermal technology options, Presidential Decree No. 18 Year 2016 is enacted. It is about the acceleration of waste-based power plants provision in DKI Jakarta, Tangerang City, Bandung City, Semarang City, Surakarta City, Surabaya City, and Makassar City.

The Decree was subjected to judicial review and subsequently revoked by the Supreme Court. As a substitute, the government enacted Presidential Decree No. 35 year 2018 concerning the acceleration of the development of waste processing installations into electrical energy using environmentally friendly technology in twelve cities, namely DKI Jakarta Province, Tangerang, Tangerang Selatan, Bekasi, Bandung, Semarang, Surakarta, Makassar, Denpasar, Palembang, and Manado. In March 2020, the Corruption Eradication Commission identified potential losses in the WtE projects. Despite these issues, the waste problem persisted and required resolution. A comprehensive solution needs to be formulated to effectively address the core issue of waste management. Samosir (2019) supported this view, stating that the government should remain focused on finding solutions for urban waste management, with energy produced being a secondary benefit.

The current study aimed to develop novel concepts regarding Indonesia's WtE financing issue using institutional theory. The theory has been applied in a number of studies on environment

issues (Neto & Fontgalland, 2024; Lim et al., 2024; Muheirwe et al., 2024; Ribeiro et al., 2024). The theoretical framework was based on the concept of The Iron Cage by DiMaggio & Powell (1983), which describes the isomorphism phenomenon. This phenomenon and the influencing elements caused organizations to follow institutional patterns when establishing formal structures, adopting policies, and making decisions (Abdelnour et al., 2017; DiMaggio & Powell, 1983; Scott, 1987). In the public sector, policy decision-making process requires a careful assessment of all relevant factors and parties. Public institutions face various forms of pressure, including those related to resources, political strength, and social or economic legitimacy. Moreover, organizational changes often result from the behavior of similar organizations, driven by the need for legitimacy rather than efficiency or competitiveness. This dynamic situation is analyzed to provide a comprehensive understanding of how WtE stakeholders interact to support the projects' success.

Isomorphism has been categorized into coercive, normative, and mimetic mechanisms (Dimaggio & Powell, 1983; Scott, 1987, 2014; Suddaby et al., 2013). Coercive isomorphism is driven by political influence and legitimation issues. The legal framework specified and influenced various organizational characteristics, such as structure and conduct (Weber, 1963 on Dimaggio & Powell, 1983). For example, the budgeting process is significantly influenced by laws and political forces, where legitimacy and resource allocation depend in part on regulatory commitment and technological requirements (Pfeffer & Salancik, 1978 on Dimaggio & Powell, 1983).

Normative isomorphism is related to the professionalization process, where professionals collaborate to create new practices based on established procedures, requirements, and prescriptive norms. Through consultation, instruction, and other methods of information transfer, professionals become moral actors who establish and correlate norms with cognitive processes (Dimaggio & Powell, 1983; Scott, 1987; Suddaby et al., 2013). However, a pure version of normative isomorphism is uncertain because professionals often experience coercive or mimetic processes when practising (Dimaggio & Powell, 1983).

Mimetic isomorphism arises from the vagueness and uncertainty of the success criteria. Institutions mimic practices from perceived successful organizations, either implicitly or explicitly (Dimaggio & Powell, 1983). Scott's cultural cognitive terminology is an elaboration of mimetic isomorphism, showing that the cultural cognitive pillar is a frame to create meaning (Jha & Aggrawal, 2018). This process is often triggered by uncertainty or a need for validation, leading organizations to unintentionally imitate others through collaboration, participation, or modelling (Dacin et al., 2002). According to (Meyer & Jepperson, 2000), managers in uncertain organizational settings are particularly prone to mimetic isomorphism, often relying on imitation when their ingenuity fails. The cultural cognitive dimension establishes a foundation that when combined with values and other factors, can lead to new coercive or normative forces (Dacin et al., 2002; Jha & Aggrawal, 2018; Scott, 2014). Adopting the concepts described, the current study aimed to propose potential solutions to financing problems that could be institutionalized by relevant organizations. The results could serve as a foundation for WtE-financing policymaking.

2. Research Methods

This study examines the institutional perspective on WtE project financing and the associated stakeholders as depicted in Figure 1, which outlines the research process. Table 1 lists the stakeholders who participated as resource persons in in-depth interviews (IDIs). The IDIs were conducted using a post-positivism method to observe and elaborate on dynamic, interrelated, and value-laden phenomena. This is well-suited for exploring the institutional factors driving financing

sources in Indonesia. Moreover, the method facilitated participants to discuss the topic based on knowledge and experience (Creswell, 2016), providing valuable insights into the factors influencing WtE financing from various stakeholders. Similar methods were adopted by Mukhtasor et al., (2023) to capture stakeholder perspectives on financing options for scaling up renewable energy infrastructure in Indonesia using an integrated Islamic blended finance scheme.

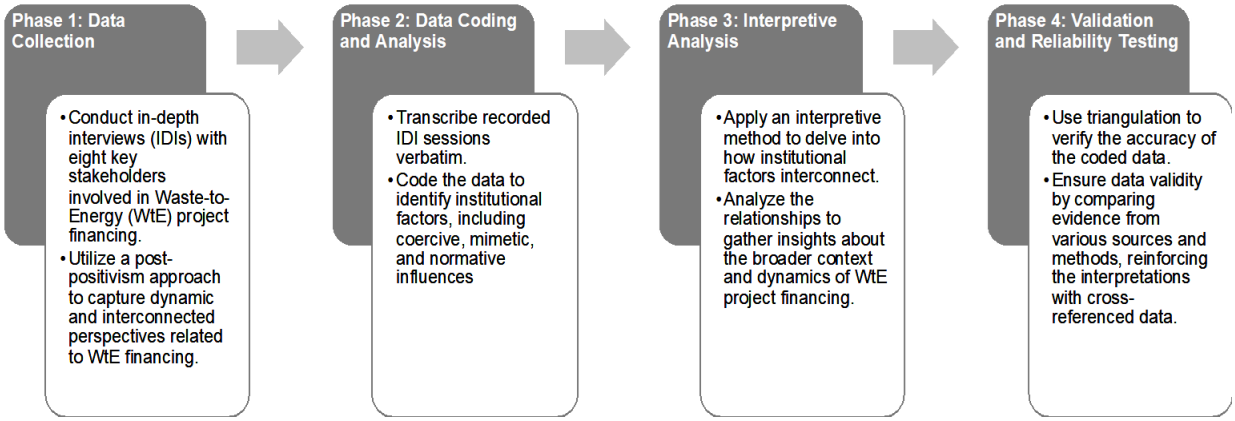

Figure 1. Research Process

The respondents included eight critical stakeholders in WtE development, and government representation comprised the Ministry of Finance's Fiscal Policy Office (climate change financing agency), the Indonesia Environment Fund (climate change fund management), the Directorate of Government Support Management and Infrastructure Financing (public-private partnership project regulator), and the Directorate of Islamic Sharia Financing (green sukuk manager). Furthermore, Bali Province represented WtE project owner, and PT GKI represented WtE private sector. PT PLN (Persero) was included as the electricity buyer of WtE generator produced by the private sector, and PT SMI (Persero) as the financier providing funding for WtE projects. The interview guidance was derived from an exploration of each respondent's role in facilitating WtE development, based on a thematic literature review. The interviews were conducted according to the schedule presented in Table 1.

Table 1. Stakeholder's Profile and Role

No	Source Person	Role	References
1	Fiscal Policy Agency, Ministry of Finance	National Designated Authority (NDA) Institution	IDI, 21 April 2021
2	Indonesia Environment Fund	Environment Trust Fund Manager	IDI, 21 April 2021
3	Directorate of Government Support Management and Infrastructure Financing, Ministry of Finance	PPP project coordinator	IDI, 7 July 2021
4	Directorate of Islamic Financing, Ministry of Finance	Green Sukuk issuer	IDI, 7 July 2021
5	Bali Province as Local Government	WtE project owner	IDI, 7 July 2021
6	PT GKI as a Private Sector	Project Investor	IDI, 26 March 2021
7	PT SMI (Sarana Multi Infrastruktur)	Accredited Entities	IDI, 8 July 2021
8	PT PLN (Perusahaan Listrik Negara)	Electricity buyer from waste to energy project	IDI, 8 July 2021

Source: processed data

The study used a three-phase qualitative method, firstly, institutionalism factors, namely coercive, mimetic, and normative, were coded from the recorded IDIs verbatim transcripts. The

coded data were subsequently analyzed using NVivo by running queries to identify the relationships between each factor. Secondly, the relationships among the institutional factors were explored using interpretive method to gain insights into their connections. The triangulation method was used to ensure the validity and reliability of the coded data in NVivo. This method validated interpretations of phenomena by testing data validity through the convergence of evidence from various sources and methods (Jessi Hanson-DeFusco, 2023).

3. Results and Discussions

3.1 Green Climate Fund (GCF)

GCF is a financial mechanism used by the United Nations Framework Convention on Climate Change (UNFCCC) to lower GHG levels. According to its Nationally Determined Contribution (NDC), Indonesia aims to reduce GHG emissions by 29 percent (by domestic efforts) or 41 percent (with extra international support) by 2030. In accordance with KMK No. 756 year 2017, the Fiscal Policy Agency, Ministry of Finance, serves as the National Designated Authority (NDA) of GCF in Indonesia. As an NDA, it serves as the primary point of contact between Indonesia and GCF.

The GCF can be a tool for attaining one of the Sustainable Development Goals (SDG) and Paris Agreement, specifically taking urgent action to combat climate change and its effects (Ahmed et al., 2023; Mohsin et al., 2023). However, since its operations in 2015, the success of the fund has significantly fallen short of earlier projections. By January 2021, the total amount of funds mobilized was around USD23.3 million, with only USD4.9 million allocated to projects that have been or are being implemented, compared to the initial projection of mobilizing up to USD100 million by 2020.

The primary challenge in engaging private sector with the GCF is its lack of interest. Currently, the GCF will largely depend on public funding to achieve its goals, so building a solid track record of impactful climate projects should be prioritized over efforts to attract private financial resources (Kalinowski, 2024; Selvapandian et al., 2023). A major challenge is the low level of education and slow-moving interest in emerging nations (Gechev, 2019). However, there are opportunities for GCF to increase climate funding in countries with few incentives for the private sector. This was confirmed during an in-depth interview with a Fiscal Policy Agency resource person, who stated that one barrier to achieving funding target was the lack of proposal submissions in accordance with the required provisions. Therefore, education is not only required in terms of writing proposals but also on the standards that projects should meet to receive funding. The experience of the Korean government with GCF showed the need for promoting citizen participation and cooperation between the private sector, volunteers, and government. Top-down approaches from the government or funders were preferable to bottom-up approaches from local communities and beneficiaries (Huh & Kim, 2018).

3.2 Green Sukuk

GoI needs to be innovative in accessing financing for projects that support efforts to address climate change and its impacts in order to achieve NDC target. The issuance of Green Sukuk is a strategic move by GoI to diversify financial assets while simultaneously achieving this national target (Sahari & Henniche, 2020; Alam et al., 2023; Hiljannah et al., 2023). However, a lack of coordination between ministries can affect the formulation of impact reporting on the results of Green Sukuk issuance, even though the credibility of these reports was crucial for gaining investor legitimacy. To ensure effective implementation at the issuance, allocation, and reporting stages,

efforts are required to improve understanding and cooperation among ministries as project owners. Several studies have raised concerns about the allocation of Green Sukuk proceeds, emphasizing the need to ensure that funds are directed toward priority areas. To address this, governments must enhance their technical and financial capacities to ensure that projects funded by Green Sukuk are sustainably operated, particularly to benefit rural communities and contribute to carbon emission reduction. Another finding highlights the critical need to balance environmental sustainability with economic development, underscoring the potential of global Green Sukuk as an effective tool for mitigating carbon emissions while fostering sustainable growth (Rahman et al., 2024; Mujizat, 2021; Suriani et al., 2024).

Green Bonds are securities issued in accordance with specific certifications, such as the Green Bond Principles, and are used to finance projects that fall under the eligible green category. It could be blended with other sources to finance the project (Mukhtasor et al., 2023). Both governments and businesses can issue green bonds to raise funds for ecologically friendly projects. GoI issues Sovereign Sukuk within the Green Sukuk framework, where the proceeds are used to finance government green projects. GoI Sovereign Sukuk is issued to finance the state budget deficit, including funding government projects. To obtain financing from GoI Sovereign Sukuk, projects should be included in the State Budget, specifically as Central Government projects in the form of capital expenditure, elaborated by the Directorate of Islamic Financing source person in an IDI.

3.3 SDG Indonesia One (SIO)

Blended finance has become a crucial tool for closing the growing funding gap for the Sustainable Development Goals (SDGs). It is a financial structuring method that combines private investments with public and philanthropic funds to advance SDGs by utilizing financial leverage (Sharma et al., 2023). SIO is a blended finance platform managed by PT SMI, designed to facilitate the engagement of philanthropic organizations, international donor agencies, climate change funds, green investors, commercial banks, and Multilateral Development Banks (MDBs). Through SIO, PT SMI conducts matchmaking between government needs and the criteria of private sector/donor/philanthropists who are committed to partnerships. In this context, PT. SMI can act as a facilitator, partner, fund manager, co-financier, sponsor, investor, and implementing agency. The types of products provided by SIO include grants, loan funds and equity, technical assistance, capacity building, as well as study and development. PT SMI is also a GCF Accredited Entity in Indonesia, and its status as a Direct Accredited Entity (DAE) facilitates the coordination and submission of program/project proposals directly to the GCF (PT SMI, 2022).

According to a PT SMI representative during the IDI, the following SIO instruments are suitable sources of WtE financing: (1) Financing Facility (specifically for construction and post-construction phases). Investors include commercial banks and institutional investors, providing financing in the form of senior and subordinated loans. (2) Risk Transfer Facility (increasing access to banking). Investors include donors, Impact/Climate Funds, and Development Banks, offering financing in the form of concessional loans, first-loss facilities, and viability gap funds.

3.4 Indonesia Environment Fund (IEF)

IEF is a public service agency (Badan Layanan Umum/BLU), a non-echelon organization that reports to and is structurally operated by the Minister of Finance of the Republic of Indonesia. It is an Indonesian government agency with the flexibility and authority to manage its affairs. The BLU structure enables IEF to gather or distribute grants and loans along with a number of other

financial tools. As Indonesia's environmental trust fund, IEF aims to direct financial resources through a variety of instruments toward specific projects and initiatives that promote ecologically friendly economic activities, minimize greenhouse gas emissions, and improve environmental management and protection.

According to the IEF source person in the IDI, financing scheme is currently developed to support the energy forest concept and community-based waste management facilities. These initiatives are still in the discussion stage with various parties. Energy compensation, or the conversion of waste into energy, may be supported by IEF in the form of a finance support plan with low-interest rates for the construction of EBT infrastructure. The Reforestation Fund, designed to facilitate financing of community-based energy forest management, provides the funds that enable access in this context. Since investments aim to reduce emissions, Reforestation Fund, currently in the Forest Development Account, offers excellent prospects for environmental investments, including those focused on waste utilization.

3.5 Coding Result

Three nodes, namely coercive, normative, and mimetic, were created based on all types of isomorphism, according to DiMaggio & Powell's (1983) version of Institutional Theory. Thematic coding was applied based on the interpretation of potential institutionalization in MSW management. This study was expected to provide policy-making ideas capable of driving Indonesia's Subnational entities, specifically those assigned to accelerate WtE development as specified by President Regulation No. 35 Year 2018. It should also institutionalize GCA into a more advanced, modern, and adequate form of MSW management through WtE development, particularly in terms of financing mechanism. The expected outcome from this institutionalization was the expansion of WtE financing paradigm toward non-budgetary, leading to the accelerated development of WtE projects nationwide. The successful acceleration can significantly reduce Indonesia's solid waste volume, thereby mitigating global climate change. The lists of nodes are presented in Tables 2, 3, and 4.

Table 2. Coding for Each Isomorphism Nodes – Coercive

No	Coercive (C)
1	WtE is one of the areas financed by the GCF, thereby minimizing the fiscal burden on Subnationals.
2	Accessing GCF funds does not require direct contact. However, it is sufficient to go through several domestic parties (called accredited entities) who will assist in the process of accessing funds (e.g., PT SMI, Kemitraan, and PT IIF).
3	To access GCF funds, projects should correspond with climate change issues, and show financial viability.
4	WtE is one of the eligible sectors to be financed by Green Sukuk, thereby minimizing the fiscal burden on Subnationals.
5	WtE can also be financed through SDG Indonesia One, thereby minimizing the fiscal burden on Subnationals.
6	Subnationals can access funds from the World Bank through channeling by PT SMI in order to finance the development of regional infrastructure, one of which is WtE.
7	One source of financing for WtE is from BPDLH, both individually and collaboratively, in the form of blended finance.

Source: processed data

Table 2 illustrates the coding results for coercive pressures, where government regulations and policies exert significant influence on municipalities. These pressures manifest through mandates that enforce compliance with sustainable waste management standards. Municipalities must align their waste management strategies with national policies, and failure to do so could

result in penalties or lack of financial support. This coercive influence ensures that municipalities prioritize waste management initiatives as part of wider environmental sustainability objectives.

Table 3. Coding for Each Isomorphism Nodes – Normative

No.	Normative (N)
1	Many government officials are still uncommitted to partnering with the private sector.
2	The regulations regarding MSW in Indonesia are still not very strict, thereby reducing the private sector's interest in it.
3	GCF is an institution that was formed especially to fund various developing country projects related to climate change, one of which is WtE.
4	One of the GCF programs that specifically fund climate change projects at the subnational level is the GSCF. Regions in Indonesia mandated as GCA (Government Contracting Agency) of WtE development can leverage this program.
5	GCF funding for waste management programs has been practiced before in South Africa's waste management flagship program.
6	The lesson from the first call for project concept note (PCN) is the weak *climate rationale* for most PCNs, confirming its rejection by the GCF.
7	Another challenge in accessing GCF funds is the uncertainty of the participation of certain accredited entities in working with PCN proponents.
8	The challenge in accessing GCF funds is the rigid mechanism for submitting proposals with approval, which takes a long time.
9	The government can bring together various investors with WtE projects, and preserving the lucrative environment is one way to increase WtE financing options.
10	The Indonesian NDA (Fiscal Policy Office, MoF) perceives waste as a national priority, hence, the proposal of waste management projects was feasible as it corresponds with national priorities.
11	The effectiveness of the service (WtE) hinges on presenting business case that benefits the community and appeals to lenders as a bankable investment.
12	WtE services can be improved by ensuring its Quality Infrastructure Investment Criteria, namely environmental aspects, inclusiveness, resilience and adaptiveness, and technological advancement.
13	The *second opinion* from Cicero stated that the renewable energy sector, which includes WtE, is in the dark green category, showing high demand from green investors.
14	Indonesia faces a critical period in waste management across its Subnationals, necessitating financing solutions similar to those of other infrastructure projects.
15	Several successful MoUs have garnered support from multilateral partners/donors, showing potential assistance in WtE financing, including Infrastructure Asia (*capacity building*), KFW (*technical assistance* and *regional loans*), ADB (*technical assistance - green finance facility*), CDIA (*technical assistance*), FMO (*technical assistance with credit facility linked to private*), AFD (*de-risking facilities* for SMI financing), and JICA (t*echnical assistance* and *capacity building*).

Source: processed data

Normative pressures, as highlighted in the Table 3, arise from professional norms and standards within the waste management sector. Professional associations, advocacy groups, and environmental organizations play a critical role in shaping the expectations for municipalities. These groups provide guidelines, training, and certification that push local governments to adopt best practices. As a result, municipalities are encouraged to meet the sector’s expectations, ensuring they align with the broader waste management and sustainability objectives endorsed by professionals.

Table 4. Coding for Each Isomorphism Nodes – Mimetic

No.	Mimetic (M)
1	To promote private sector participation, the government should provide comprehensive explanations regarding the existence of VGF facilities, Feed-in-Tariffs, etc.
2	WtE scheme by the Subnationals should prioritize waste elimination over revenue generation to benefit the private sector.
3	The project portfolio funded by the GCF, which uses grant instruments in its funding, has the most significant percentage compared to other financial instruments. Therefore, this has significant advantages for developing countries.
4	Despite passing initial assessments, some PCNs fail to attract interest from accredited entities due to their preference for grant-based funding structures.
5	Capacity building is essential for the success of PCN proponents.
6	The government should encourage and engage with the private sector by providing them with incentives, cheap loans. This is to ensure financing side of WtE is more widely open.
7	One of the BPDLH programs that have potential as financing for the WtE project is the *Reforestation Fund*.
8	BPDLH aims to develop WtE financing that is non-budgetary, fast, and can be received directly by all stakeholders.
9	From the perspective of the GCF as a financier, there are limitations so that it is more inclined toward the most commercialized funding proposal.
10	Based on the list of projects in the BKF, accessing GCF funding entails a lengthy process.
11	For GCF, the complexity of the domestic bureaucracy is manageable, but global-scale operations can be challenging in terms of timing.
12	Adjusting project timings with uncertain GCF funding presents a significant challenge.
13	The issue of land certainty is crucial in this waste management project because this issue will become a constraint on the determination of WtE technology, which will then affect its financing and funding planning.
14	The government anticipates potential investors willing to invest in green-labeled instruments, one of which is WtE.
15	Strict criteria for obtaining *green label* can affect investors confidence in Green Sukuk instrument.
16	Attracting investors can be challenging when Subnational fiscal capacity is insufficient for the sustainability of WtE. Also, the locals rely on the central government for projects sustainability.
17	Government support improves project bankability and attracts investor participation.
18	PPP and bonds issued by the relevant Subnationals offer financing options for WtE projects facing financial challenges (Green Sukuk can also be used through its *general financing*).
19	SIO provides blended financing opportunities from the private sector, mobilizing private investment to address sustainability issues, increasing access to financing for infrastructure development, and minimizing the fiscal burden for fulfilling SDGs issues (specifically Subnational as GCA).

Source: processed data

Mimetic pressures, detailed in the Table 4, reflect how municipalities look to successful models from other regions for inspiration. By imitating or benchmarking against high-performing municipalities, local governments adopt innovative financing and management practices that have proven effective elsewhere. This replication of best practices allows municipalities to adapt solutions that have already demonstrated success, reducing uncertainty and fostering innovation in waste management.

3.6 Discussion

According to Table 2 (Coercive), WtE has already been identified as an eligible sector for funding through various financing instruments, both nationally and internationally. At the national level, as shown in matrix C4 (column C row 4), WtE is eligible for financing through Green Sukuk, thereby minimizing fiscal burden on the Subnationals. However, accessing Green Sukuk requires projects to fall under central government authority, posing a challenge for local government initiatives to access this financing option. Despite the existence of Indonesia Environment Fund (IEF), an environmental funding mechanism for channeling and distributing environmental and

climate funds (C7), there is no specific instrument in place for its execution, according to an interview conducted on April 21, 2021.

The coding results (specifically in matrix C1, C2, C3) showed that access to GCF among other financing options could serve as source of coercive pressure for WtE initiatives, shaping policy design to compel Subnationals to take action, given fiscal constraints (formal regulations such as president or ministerial decrees). Matrix C2 showed the strategic role of PT SMI in the SIO (C5, C6) and as a DAE in GCF, making it the primary entity Subnationals should engage with to access funding for WtE initiative. Acting as a local institution accreditated by GCF with a national mandate, PT SMI was responsible for compiling and delivering Concept Notes (CN), which are Proposals of Project Preparation Facility (PPF) and Funding Proposal (FP) for green program/project to NDA GCF. By regulating (giving the coercive pressure) the mechanism with accredited entities, the Subnationals can be actuated to use financing or funding options. For analysis purposes, all coercive matrices in the Table 2 were assumed to be hypothetical future regulations or policies.

In the Table 3, the normative (N) ideas were contextualized from information transfer and professional transformation such as South Africa's experience in waste management flagship program (N5), the ideal PCN to address climate rationale (N6, N7, N8), and undesirable circumstances that needed to be fixed (N1, N2).

The mimetic (M) ideas in the coding (Table 4) showed the importance of prioritizing waste elimination over revenue generation (M2) in WtE projects. In this context, two of the three key factors, namely intermediaries and pipeline, identified by Blended Finance Task Force (2019), were relevant. Matrix M1, M3, M4, and M6 mentioned potential public intermediaries as crucial components of capital mix-up, capable of reducing risk perception, thereby attracting private interest through government incentives, viability gap funds, and grants. Meanwhile, M5, M9, M16, and M17 discussed the pipeline, another blended finance key factor. A project should be financially viable in order to receive necessary funding. This showed the importance of drafting a persuasive PCN to attract potential investors, and the need for capacity building among project owners. As a platform, M10 and M11 mentioned the potential use of GCF for its less bureaucratic procedure at the national level, although the entire process could still be lengthy.

Table 5. Degree of Correlation among Nodes

Code A	Code B	Pearson Correlation Coefficient
Mimetic	Coercive	0.375
Normative	Mimetic	0.270
Normative	Coercive	0.107

Source: processed data

After the coding process, a cluster analysis was conducted in NVivo based on the word similarity of the nodes. The objective was to ascertain the extent of correlation between each node. The results (Table 5) showed that mimetic and coercive had the strongest correlation, followed by normative and mimetic, and normative and coercive. Figure 2 presents the findings of this research, illustrating the relationships among these isomorphic elements. The following section provides a discussion of each relationship as illustrated in Figure 2: mimetic – coercive relationship, normative – mimetic relationship, and normative – coercive relationship.

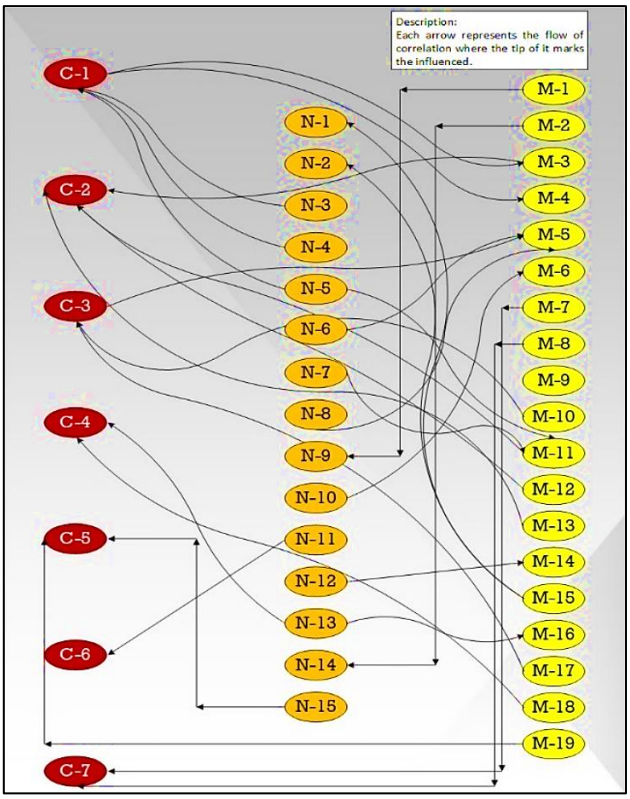

Figure 2. Mapping of Codes Relationship

The Table 5 shows that C1 is closely related to M3 and M4. To support the coercive measures, aimed at mandating subnational budget financing (hypothetical future regulations or policies as previously mentioned), policymakers might consider apprising the benefits of utilizing GCF financing through the grant mechanism. M3 reported that as of January 2021, the grant instrument had precedence over other financing options (Figure 3). According to M4, this was a promising news, considering that most accredited entities in developing countries preferred grants.

Figure 3 presents the distribution of available financial instruments, based on data from an in-depth interview with the Fiscal Policy Office of the Ministry of Finance in 2021. The chart highlights the various tools used to support financing, such as grants, government loans, and other sources, each contributing differently to the overall financial landscape. This distribution reflects the diversity of funding mechanisms available to accelerate municipal solid waste management initiatives.

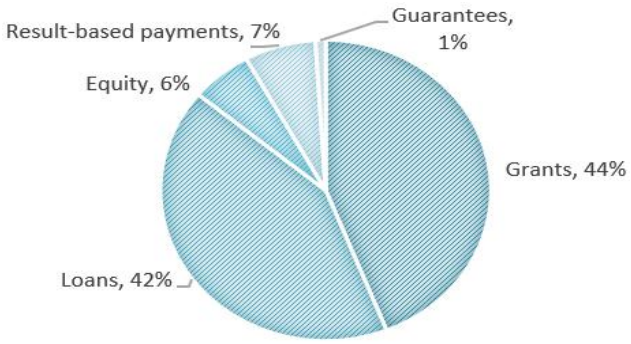

Figure 3. Available Financial Instruments

Mimetic action (M3) could impact another coercive item, namely C2. Considering the information from M3, accredited entities might increase support through grant financing

mechanisms to GCF. Other relationships between C2 and mimetic items were observed with M11, M12, and M13. M11 showed Indonesia's NDA (Fiscal Policy Office) received a fair amount of PCN in SWM during 2021, some of which are listed in 6. This showed waste management sector had a positive appeal, instilling confidence in accredited entities to extend support to regional projects. M12 also supported C2 by stating that the domestic bureaucracy complexity was less significant than the global challenges. However, M13 mentioned that one of the global scale bureaucracy issues was correlating project timing with the uncertain timing of GCF funding provision.

Another mimetic–coercive relationship originated from C3, impacting the existence of M5. The rigid project requirements, both environmentally and financially, were confirmed by source's statement related to the urgency in improving PCN proponent drafting capacity. Meanwhile, C3 was implicitly supported by another mimetic idea, with M10 advocating for proposals to adopt a commercial stance, and M17 showing the necessity of government support to ensure financial viability and attract potential investors. This knowledge could facilitate coercive hypothetical future regulation stipulated in C3.

Table 6. Shortlisted PCN from Call for Project (Waste Sector)

No	Project Name	Project Proponent	Location
1	Circular economy of industrial effluents for low emission transport through the application of Bio-CNG technology in Indonesia	Raja Rafa Samudra	National
2	Empty fruit bunches pellet industrial project	Ailesh Indo Energi	Siak
3	Accelerated solid waste management with artificial intelligence	Gringgo Tech Indonesia	Bali, NTB, South Sulawesi
4	Towards Indonesian clean rivers through Ciliwung care community (waste-to-energy)	Hexa Integra Electrica	Jakarta
5	Application of circular economy principles to solid waste management for decarbonized transport and industrial production fuel (Bio-CNG)	Gikoko Kogyo Indonesia	[not mentioned]
6	Implementing circular economy in community-based solid waste management as climate mitigation action for sustainable environment	LGBS NTB	NTB
7	Preventing climate change for target achievement contribution to Indonesia first NDC implementation through waste handling and producing organic fertilizer and feed supplement to improve community prosperity	LAPI ITB	West java

Source: processed data

The normative-mimetic relationship surrounding GCF topic is shown in the following connections: N5 & M11, N6 & M5, N7 & M11, N8 & M5, N10 & M6. Information from matrix N5 concerning a successful GCF financed-waste management project in South Africa contributed to the mimetic institutionalization effort of M11. Furthermore, capacity building among PCN proponents to improve PCN acceptance (inferred from the relationship between N6 & M5, N7 & M11, N8 & M5) showed the government's prioritization of supporting the private sector, specifically through incentives and low-interest loans (N10 & M6).

Only a few correlations were found between normative and coercive items, specifically in the context of GCF where hypothetical future regulations or policies were set. These correlations included C1 & (N3, N4, N5). Using the statement in the three normative coordinates for institutionalization could ease policy target to fulfil the coercive institutionalization. For example,

providing technical assistance to introduce the Global Sub-national Climate Fund (GSCF) program to the Government Contracting Agency in the regions (N4) could further induce the Subnationals to use financing (non-budgetary) option.

4. Conclusions

This study examined the institutionalization of Waste-to-Energy (WtE) development acceleration under Presidential Regulation Number 35 of 2018, revealing that the policy-making process was primarily influenced by mimetic and coercive pressures, with significant interactions between normative-mimetic and normative-coercive forces. Theoretically, this research advances institutional theory by illustrating the dynamic interplay of these pressures in shaping WtE implementation, while highlighting Indonesia's potential to leverage blended finance mechanisms—such as financial intermediaries and project pipelines—for WtE projects. To accelerate progress, this study recommends strengthening non-budgetary financing through intermediaries like PT SMI to access international climate funds, enhancing capacity building for subnational governments to prepare globally standardized Project Concept Notes (PCNs), and adopting a normative-coercive approach through regulatory incentives and compliance frameworks. Additionally, clear guidelines for accessing blended financing, issued via Ministry of Finance regulations, and improved stakeholder collaboration, coordinated by *Kantor Bersama KPBU*, are essential to address fiscal constraints and implementation barriers. Despite limitations in stakeholder engagement, future research should explore innovative project structuring and financing schemes to further advance WtE development at the subnational level.

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