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The policy gap: how Dhaka's rapid urbanization challenges energy security in an import-dependent Bangladesh

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Abstract

The hyper-dense urbanization of Dhaka is exceeding the ability of the import-based energy system in Bangladesh, but the policy disconnection between urban planning and energy governance has not received much research. This paper analyzes the role of institutional narratives and institutional coordination breakdowns between urban planners and energy utilities in enhancing energy insecurity. Based on qualitative document analysis of statutory annual reports (2023-2025) of the three largest utilities in Dhaka and spatial analysis of satellite imagery (2020 & 2025) we can define the systematic policy gap: utilities present urbanization as an exogenous operational hazard (spatialized risk), but not an integrated planning variable, and blame the blame on a supposedly macroeconomic helplessness. Thematic analysis demonstrates that there are four common patterns, such as spatialized risk, discourses of import dependency, difference in resource framings between gas and electricity industries, and retrospective infrastructure correction, which all prolong siloed governance. On a quantitative level, satellite data indicate that residential load increases by more than 60 percent in the peripheral areas over the past five years with the green cover giving way to concrete infills. Methodological drawbacks such as use of publicly available institutional documentation, which is likely to underrepresent informal practices and realities of day-to-day operations, are also present. In practice, we suggest three forms of governance: zonal energy budgeting, vertical prosumer cooperatives and metabolic infrastructure synchronization would put urban growth back into the path of distributed, domestic energy solutions. The implication of these findings is that the decoupling process of megacity development and import traps needs to be forced through the establishment of cross-sectoral regulation and incorporation of energy requirements into the spatial planning codes.

Keywords: Urban Governance; Energy Security; Urban Metabolism; Global South; Import Dependency; Institutional Friction.

1. Introduction

Dhaka is a hyper-dense megacity that has a population of about 36.6 million people. It is the economic and demographic powerhouse of Bangladesh which is the epicentre of a deep energy security crisis [13]. In 2022, the country rejoiced in universal access to electricity; however, the infrastructure is loosely connected to an unstable, import-based model [16]. The change to liquefied natural gas and imported coal is the most apparent sign of this dependency, where the aim of these imports is to offset the domestic gas shortage, but has served to make the economy more vulnerable to fiscal pressures and susceptible to global price shocks [8, 20]. The city's population is growing fast, and the **graying** of the previously green canopies in such regions like Purbachal and Keraniganj takes monstrous proportions. In certain cities, energy consumption has increased by more than 60 percent in the last 5 years, exceeding the sustainable supply of the country [12, 13].

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But, the policy gap in the energy security in Dhaka is more of discursive and institutional than merely technical or financial nature. The existing practices, like the 4As model, tend to consider energy security as a supply chain problem and not as a dynamic performance of urban governance. It is becoming more understood that the city is not well coordinated in its growth and energy infrastructure, with the unplanned urbanization resulting in an uneasily coordinated and fragmented utility practice. This study re-emphasizes the institutional discourses and histories that shape policy, asking: How do institutional differences in the stories and communication gaps between urban planners and energy utilities in Dhaka contribute to the policy gap and exacerbate energy insecurity in an import-dependent regime?

This study is new as it explicitly explores the ontological divide and institutional friction based on qualitative document analysis of utility discourse (thematic framework of Braun and Clarke) and triangulation with longitudinal satellite data (2020 & 2025). The gist of the findings is that utilities explain their operational issues, including residential load escalation and import traps, in a manner that supports fragmented energy governance. The results highlight the criticality of revolutionary, decentralized, and integrated models, namely vertical consumer cooperatives, zonal energy budgeting, and metabolic infrastructure synchronization, that refocus urbanization in Dhaka on a more resilient and domestic-oriented energy future.

2. Literature Review

Recent research in Bangladesh's energy sector has shifted from a focus on access to notions of **security** and **fiscal sustainability** [8, 16]. The 4As framework indicates that accessibility and availability of energy has been enhanced through huge growth of the grids [3]. Nevertheless, the affordability and acceptability of the existing mix of imports-heavy are under threat [3]. The shift to imported LNG is a threat to domestic energy security. It puts financial strain on the grid and puts the grid at risk of international volatility [2, 20]. This forms a sustainable supply-demand gap in Dhaka. The huge peak loads are on residential demand, particularly the cooling demand. Existing infrastructure is only able to survive by rolling blackouts [13].

2.1. Institutional Discourse and Siloed Governance in the Global South

Another problem in the energy transition of the Global South that is often ignored is the disjointed communication and coordination between government agencies. Numerous fast-growing cities use technical energy delivery schemes that do not fit the urban planning rules. This has forced agencies like the Bangladesh Power Development Board and Titas Gas Company to work in reaction towards the urban growth instead of being proactive in planning.

Legacy is often a focus of institutional discourse, but it is centralized energy systems, not innovative and flexible alternatives. Dhaka has a sharp schism between urban planners who focus on land use and building and utilities that focus on quantitative growth measures. There is, however, limited coordination between these entities. Such continued absence of cooperation makes the energy network always fall behind the spatial growth of the city, leading to energy wastage and putting the major utilities in Dhaka under financial burden.

2.2. Theoretical Grounding: Urban Metabolism and Prosumer Cooperatives

This paper proposes the concept of urban metabolism to solve these problems, which views the city as a network of resource flows. A study of the flow of electricity, gas and information in Dhaka shows that there is inefficiency and wastage of resources which is a symptom of the poorly integrated systems. By looking at how the changes in climate and the rapid urban expansion are affecting these flows, new solutions can be identified that do not only focus on the supply but also go further.

Also, energy cooperatives, where individuals both generate and use energy, offer a way to have localized energy control and less reliance on imports. These cooperatives use cooperative ownership and decision-making to enable the adoption of renewable energy which may reduce the dependence of Dhaka on foreign sources. Considering the overcrowding of Dhaka and the scarcity of space, such cooperatives would allow people to own and share the common energy resources, including rooftop solar systems. This strategy supports the policy recommendations pursued in this paper such as encouraging the formation of local energy cooperatives and the coordination of infrastructure to enable active residents in improving energy security.

2.3. Summary of Literature Review and Policy Gaps

Table 1 Key Findings and Policy Gaps in Urban Energy Literature

Theme	Objectives	Matrices Studied	Key Findings	Policy Gaps	Citations
Sustainability Pathways	Analyze power sector transformation	Fossil Fuel vs. Renewables	Universal access has been achieved, but fuel imports and exchange rate volatility threaten it	Lack of clear roadmaps for de-risking import-dependent models	[8]
Urban Energy Matrix	Assess the Renewable Energy feasibility in Dhaka	Natural Gas & Electricity	85% of Dhaka's power comes from gas, leading to recurrent load shedding	Failure to integrate Renewable Energy into building codes in dense urban areas	[13]
4As Framework	Evaluate energy security policies	Availability/ Affordability	Current policies focus on availability but neglect the affordability of imported fuels	Fragmented institutional settings for energy advancement	[3]
Energy Insecurity	Analyze energy security challenges	LNG Dependency	Shift toward imported LNG creates long-term fiscal and supply insecurity	Lack of a strategic buffer against global fuel price shocks	[20]
Urban Innovation	Reframe energy as foundational development	Sector Coupling/ Siloed Governance	Technocratic models and siloed governance hinder energy innovation in informal cities	Absence of co-produced, inter-infra solutions (sector coupling)	[7]
Urban Metabolism	Analyze resource flows in the Global South	Urban Metabolism	Urban metabolism is a holistic framework for identifying deficiencies in urban systems	Lack of Urban Metabolism studies in the Global South to guide mitigation	[15]
Energy Communities	Evaluate the democratization of Renewable Energy	Prosumer Cooperatives	Cooperatives offer a path to energy democratization and to reducing throughput	Absence of legal frameworks for shared energy ownership in high-rises	[17, 18]
Urban Governance	Link urbanization with health/environment	Unplanned Urbanization	Rapid expansion creates socioeconomic determinants that strain governance	Failure to synchronize urban expansion with utility infrastructure	[1, 19]

3. Methodology

3.1. Research Design and Methodological Approach

The research design used in this study is the qualitative research design, where a methodological triangulation of **Qualitative Document Analysis (QDA)** and visual spatial analysis is employed in order to critically analyze the institutional discourse of energy security and urban development in Dhaka. As defined by **Bowen (2009),** Qualitative Document Analysis (QDA) is particularly a suitable methodology to study policy in the Global South, where it is possible

to critically analyze printed and electronic documents to reveal underlying organizational anxieties and institutional logic [5]. This strategy encapsulates the policy gap as conceived and framed by utility providers in Dhaka, rather than limiting the analysis to quantitative financial indicators, particularly in the context of urban expansion and rising dependence on imported primary energy.

3.2. Document Selection and Sampling Strategy

The specific set of documents in this study was selected using a purposive sampling strategy. The primary data includes the statutory Annual Reports (FY 2023-2025) of three largest energy distributors in Dhaka: Dhaka Power Distribution Company Limited (DPDC), Dhaka Electric Supply Company Limited (DESCO) and Titas Gas Transmission and Distribution Company Limited. Moreover, Bangladesh Petroleum Corporation (BPC) reports were also added to present macro-contextual information on the national fuel import anxieties.

These particular documents have been selected since they reflect a full cross section of the energy value chain, including fuel purchasing and gas distribution, all the way up to power supply in cities. Moreover, in Bangladeshi context there exists a severe lack of open, transparent internal data of government utility agencies and institutional secrecy tends to hide grid vulnerabilities and fuel rationing. Statutory annual reports, which are legally required, are a way of overcoming this institutional opaqueness and present audited reports and formal managerial accounts (e.g., messages by chairmen and directors) that reflect the official view of the state. These documents provide a special, institutionalized insight into the strategic preoccupations and geopolitical anxieties of utility management, including the "dollar crisis" and the unplanned urbanization, which is not often expressed through conventional public policy language.

3.3. Thematic Analysis Procedure, Coding Reliability, and Validation

The interpretation of textual data followed the six-phase thematic analysis model created by **Braun and Clarke (2006)** in a systematic manner [6]. Coding reliability and thematic validation were rigorously upheld to enhance methodological rigor:

- **Familiarization:** The process started with immersive, repeated readings of the sections "Chairman's Message," "Director's Report" and Risk Disclosure sections of the 2023-2025 reports.
- **Initial Coding and Reliability:** Recurring narrative patterns were assigned short-hand labels, including: foreign exchange risk and unplanned city growth. To determine the reliability of coding, an iterative coding procedure was developed in which the raw codes were repeatedly compared with the source texts in order to obtain consistency and reduce the subjective drift.
- **Thematic search:** Codes were consolidated into bigger conceptual areas in a systematized manner, tracing the discursive tension between resource scarcity and demand explosion.
- **Reviewing/Validating Themes:** Triangulation of sources was done to validate themes. Themes were checked to make sure that they reflected the raw data accurately in all four different utility providers, making sure that the institutional logics identified are systemic and not specific to one agency.
- **Defining and Naming:** Academic nomenclature was used to effectively enclose institutional speech, e.g. the definition of disjointed planning as Institutional Friction: Infrastructure as Retrospective Correction.
- **Reporting:** The findings were integrated into a cohesive analytical narrative to show the spatial energy policy gap.

3.4. Systematic Spatial Visual Analysis and Triangulation

A thematic analysis was triangulated against a systematic visual spatial analysis of Google Earth Pro historical images (2020 & 2025) to create a valid methodology that would support the qualitative results. This spatial element was not only descriptive but analytic, and aimed at questioning visually the discursive arguments of the utilities about the so-called unplanned sprawl and high density.

The spatial analysis was done by the chronological comparison of the structural changes in the Dhaka metropolitan area. A 2020 baseline was set through systematic observation of selected peripheral regions, including Purbachal and Keraniganj, characterized by visible green canopies, water bodies, and fragmented road infrastructure. This was compared systematically against 2025 imagery that demonstrated the overall graying of the map that was hyper-dense with concrete infill and residential development along utility corridors. Such spatial results were traced directly to the qualitative data; e.g., the internal accounts by Titas Gas Transmission and Distribution Company Limited, Dhaka Electric Supply Company Limited, and Dhaka Power Distribution Company Limited of the spatialization of risk were cross-correlated with the physical evidence of the physical encroachment of urban growth on the infrastructure corridors in the form of satellite images. This triangulation manages to fill the gap between the discursive and internal realities of the utilities, and the material and geographical reality of the aggressive horizontal sprawl of Dhaka.

3.5. Positionality, Researcher Bias, and Limitations

Even though this methodology offers a robust framework of locating the gaps in institutional policies, explicit limitations and possible researcher biases cannot be ignored. The excessive use of Qualitative Document Analysis (QDA) runs the risk of an interpretative bias in the process of coding. Although this is countered by thematic validation of various utility reports, qualitative interpretations of the concept of institutional friction are subjective.

Moreover, one of the structural weaknesses of the study is that it uses only institutional and statutory publications as they are the formalized, top-down view of state utilities. As a result, these reports might not adequately record or reflect informal procedures, the realities of everyday operations in the city or grassroots energy consumption practices among the people of Dhaka. The actual policy gap, in terms of its physical appearance through the crippled models of centralized infrastructure, is examined in the context of utility providers who might naturally generate discourses that avoid placing blame on the impractical urbanization, but rather help to cover up internalized management inefficiencies. This institutional analysis should be complemented by future research with primary data collection and techno-economically appraisals of the urban energy metabolism in order to obtain a more comprehensive picture of the same.

4. Spatial Triangulation: Visualizing Dhaka's Urban Sprawl

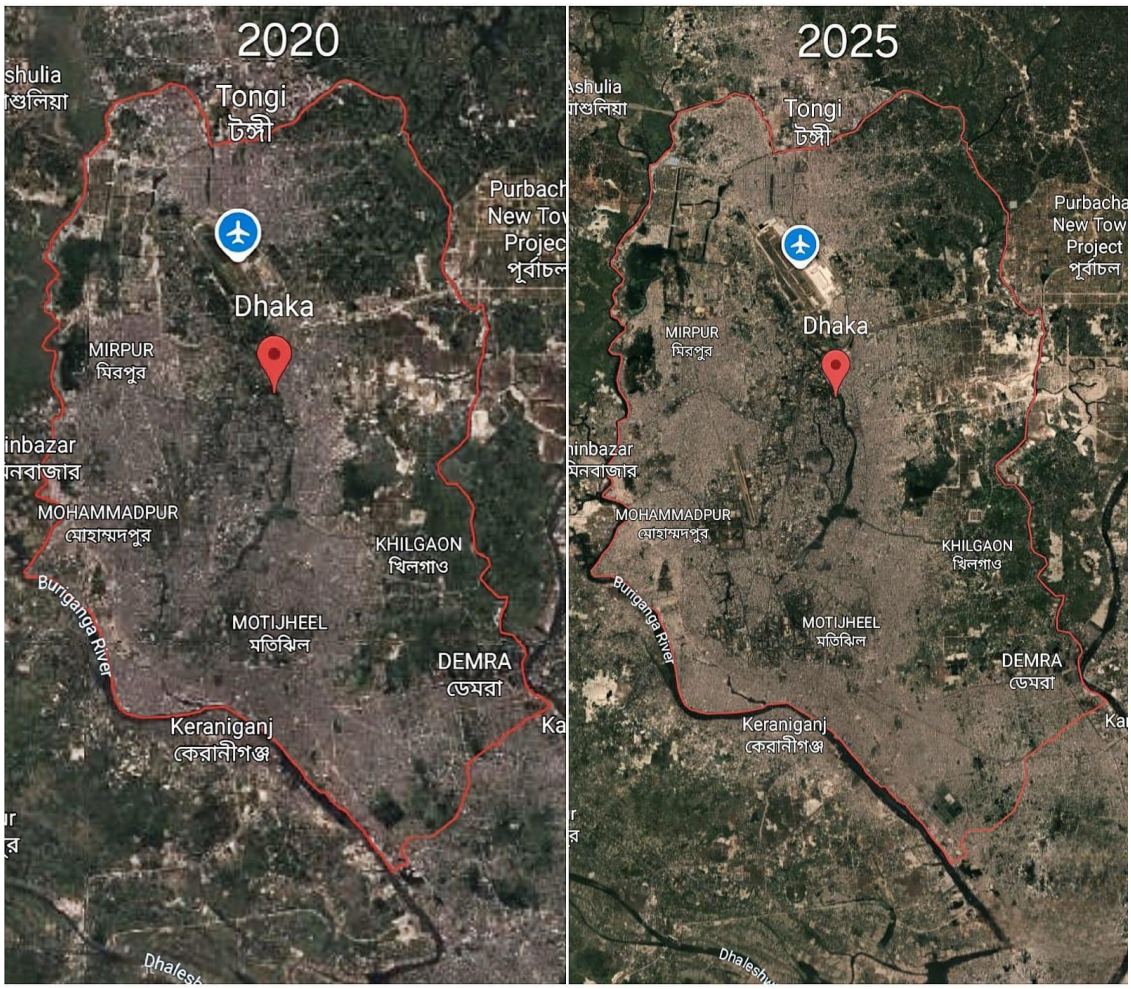

Figure 1 Satellite imagery showing rapid spatial expansion and concrete infill in the Dhaka metropolitan area (2020 & 2025). Imagery ©2025 Google. [14]

In order to contextualize the institutional anxieties that have been revealed in the sequential thematic analysis, visual spatial triangulation of Google Earth historical imaging between 2020 and 2025 was performed. This five-year base describes a fundamental demographic and structural shift in the Dhaka metropolitan region, which is visually supported by the discourse of the utilities related to unplanned urbanization. As of 2020, peripheral areas, including Purbachal and Keraniganj, still had visible green canopies, water bodies, and disjointed road networks. By 2025, though, the process of graying of the map became almost total, with hyper-dense infill of the concrete and blistering development

of residential buildings along utility corridors. This physical testimony is the material ground of the policy gap which is examined in this paper; it is the physical manifestation of the aggressive, horizontal geographical extension which has crippled the centralized, reactive models of infrastructure of the energy utilities in Dhaka.

5. Thematic Analysis

This thematic analysis implements the framework of Braun and Clarke on the annual reports of the three main energy utilities of Dhaka (Dhaka Power Distribution Company Limited (DPDC), Dhaka Electric Supply Company Limited (DESCO), and Titas Gas Transmission and Distribution Company Limited) in the period of 2023 to 2025. This analysis reflects systemic policy gap where urbanization is viewed as a disruptive force, instead of planned variable by synthesizing their internal discourses.

5.1. Theme 1: "Spatialized Risk": Urbanization as an Operational Hazard

5.1.1. Qualitative Description

This theme presents the growth of Dhaka not as growth, but a **high density** that poses a threat to the stability of utility. The discussion in all three utilities describes the city structure as **unplanned** and **risky**, and turns the story of service delivery to the defense of mitigation. Urbanization is referred to as a spatial limitation that actively impedes safety and efficiency.

5.1.2. Direct Quotations/Paraphrased Discourse

- **Dhaka Power Distribution Company Limited (DPDC):** The article frames Dhaka as the **"most densely populated city in the world**," and claims that providing power in such **"unplanned cities is always risky"** [11].
- **Dhaka Electric Supply Company Limited (DESCO):** The company is concerned about the **"increasing load demand"** in **"densely populated"** areas as the complexity of the urban environment dictates that the load forecasting should be revised continuously [9].
- **Titas Gas Transmission and Distribution Company Limited:** Makes it clear that the expansion of Dhaka is an **"unplanned and uncontrolled urbanization,"** directly contributing to the **"illegal gas connections"** and the increased threat of safety [22].

5.1.3. Analytical Insight

The utilities shift responsibility of the inefficiencies of the system by referring to the city as **unplanned**. This exposes an energy **policy gap**: energy providers consider themselves **victims** of urban sprawl and not participants in urban planning, creating a reactive and not proactive approach to infrastructure planning.

5.2. Theme 2: "Macroeconomic Helplessness": The Geopolitical Import Trap

5.2.1. Qualitative Description

A common discourse of **financial vulnerability** is observed in all three utilities in relation to external shocks in the world. The reports move away from operational metrics to focus on the **dollar crisis** and **forex volatility**. It is a feeling of helplessness where utility survival does not depend on management anymore but on the changing prices of the international LNG and fuel markets [4].

5.2.2. Direct Quotations/Paraphrased Discourse

- **Dhaka Power Distribution Company Limited (DPDC):** Confesses that the **"global energy crisis"** and **"dollar price hike"** have tightened the growth of systems and cost of operation [12].
- **Dhaka Electricity Supply Company Limited (DESCO):** Directly blames its financial stress and the **"forex loss"** on the **"Russo-Ukraine war"** and the consequent **"present hike in the dollar prices"** [9].
- **Titas Gas Transmission and Distribution Company Limited:** Explains a **"staggering net loss"** of **TK 772.04 crore** in the year 2024-25, positioning such failure as an essential consequence of the **"increased gas purchase costs"** in the international market [22].

5.2.3. Analytical Insight

In this discussion, there is a loophole where the monetary policy (foreign exchange rates) has taken the place of energy policy. This situation traps the utilities in an **import-dependent** model that obliges them to take in **global price shocks** without the policy instruments to address them domestically, which is a demonstration of a deficiency of energy sovereignty.

5.3. Theme 3: "The Divergent Resource Narrative": Scarcity vs. Explosion

5.3.1. Qualitative Description

This theme encompasses the discursive conflict between the **shrinking** gas sector and the **growing** power sector. Where Titas Gas Transmission and Distribution Company Limited use the rhetoric of **finitude and conservation**, the electricity companies Dhaka Power Distribution Company Limited (DPDC)/Dhaka Electric Supply Company Limited (DESCO) are ones that continue to use the rhetoric of **unending growth**. This generates a story of an imposed resource exchange, where gas is diverted to power plants and distribution utilities have to cope with the backlash of rationing.

5.3.2. Direct Quotations/Paraphrased Discourse

- **Titas Gas Transmission and Distribution Company Limited:** The company uses a warning slogan, **"Natural gas is not inexhaustible, stop wasting natural gas,"** and acknowledges a **"production deficit"** in the national fields [21, 22].
- **Dhaka Electric Supply Company Limited (DESCO):** Compensates this unavailability with an enormous demand spike, a load **of 2,468 MW** by 2041, and constant **"capacity building"** [9, 10].
- **Dhaka Power Distribution Company Limited (DPDC):** It is geared towards satisfying the **"huge demand"** by the means of **"expansion and strengthening"** of the power system, which appears to have little in common with fuel deficits that bedevil the gas sector [11].

5.3.3. Analytical Insight:

Here, the **policy gap** refers to sectoral silos. Titas Gas Transmission and Distribution Company Limited is dealing with a **deficit**, whereas Dhaka Power Distribution Company Limited (DPDC) and Dhaka Electric Supply Company Limited (DESCO) are operating under the anticipation of an explosion in demand. This is an implication that the urbanization of Dhaka is powered by electricity and the main underlying energy (gas) is in the process of being **phased off** and there is no concerted approach to this withdrawal.

5.4. Theme 4: "Institutional Friction": Infrastructure as Retrospective Correction

5.4.1. Qualitative Description

The last theme determines the **coordination gap** between utilities and urban planning organizations (e.g., RAJUK, RHD). Each of the three utilities talks of their infrastructure being **trapped** or **displaced** by other development projects. This depicts a topography of **siloed governance** where the development of one agency (road widening) causes the crisis of another agency (pipe relocation).

5.4.2. Direct Quotations/Paraphrased Discourse

- **Titas Gas Transmission and Distribution Company Limited**: Documents the presence of a **"high-risk situation"** where widening of highways has caused existing distribution lines to be **"in the middle of the highway,"** requiring them to be replaced at high costs and with no planning [22].
- **Dhaka Power Distribution Company Limited (DPDC):** Notes how the placement of **"underground cables"** and maintenance of the grid is continuously stalled by the **"unplanned"** city structure and the inability to coordinate with other service providers [12].
- **Dhaka Electricity Supply Company Limited (DESCO):** Provides an insight into the **"hurdles"** to land acquisition in a congested city and the necessity to match the plans of the **"RAJUK-approved layout plans"** only after urban density has complicated the deployment of infrastructure [9].

5.4.3. Analytical Insight:

This reinforces the **policy gap** by showing that infrastructure is never proactive. The presence of a gas line in the **middle of a highway** indicates that the Roads and Highways Department and Titas Gas Transmission and Distribution Company Limited are institutionally operating under different realities. Urbanization in Dhaka is therefore a retrospective correction process and not a coordinated plan.

6. Results and Discussion

6.1. Results: Institutional Discourse on Urbanization and Energy

The Qualitative Document Analysis (QDA) indicates the critical ontological gap between the spatial development and energy management in Dhaka. Although urbanization is an unavoidable demographic fact, the three main utilities of Dhaka (Dhaka Power Distribution Company Limited (DPDC), Dhaka Electric Supply Company Limited (DESCO), and Titas Gas Transmission and Distribution Company Limited) continue to frame this growth as a reactive burden and source of risk that is spatialized.

This discursive anxiety is pegged on measurable operational strains which the utilities reported. Over the last five years, some regions have experienced a major jump in energy use, pushing demand more than 60% above sustainable domestic supply [12]. At the same time, internal forecasting of Dhaka Electric Supply Company Limited predicts a growing load requirement of 2,468 MW in 2041, which requires a continuous process of reactive capacity construction [9, 10].

Rather than considering these metrics as variables in the integrated urban planning, a strong dependence on the discourse of narratives of macroeconomic helplessness is employed by the institution. Global shocks are often used by utilities to explain their financial instability; Titas Gas Transmission and Distribution Company Limited is no exception, as a huge net loss of TK 772.04 crore in the 2024-25 fiscal year was directly attributed by the company to high costs of buying gas in the international market [22]. This framing enables the agencies to transfer the responsibility of systemic inefficiencies to global volatility or the unplanned characteristics of the city. Thus, such siloed governance has a tangible impact in fragmented, dangerous infrastructure, as gas distribution lines are abandoned in the middle of newly expanded highways, because the agencies do not coordinate their efforts.

6.2. Discussion: Contextualizing the Policy Gap

These findings make dominant narratives more difficult and challenging in current energy security literature. The 4As framework has highly applauded the fast rate of grid expansion in Bangladesh with a focus on the attainment of universal energy accessibility. Nevertheless, the findings of this paper indicate that the application of technocratic models of supply chains obscures important institutional friction and disregards the dynamic performance of city governance. The grids have increased but the affordability and acceptability of this import-heavy mix is being drastically undermined [3].

Although Chowdhury et al. (2025) and Siddiky (2021) accurately identify the fiscal and supply vulnerabilities tied to imported LNG, this paper finds that utilities are strategically using this geopolitical dependence to buffer criticism and shape the discourse [8, 20].

Critical perspectives in the conventional city planning tend to propose that centralized and supply-side interventions are the most effective means of controlling megacity growth. However, the systemic shortcomings identified in this study align closely with those discussed by Caprotti et al. (2025), who suggest that siloed and technocratic governance structures can hinder energy innovation in expanding urban contexts [7]. The perception of energy as a foreign input and not part of the whole city as an urban metabolism results in wastage of resources and a continuous lag in infrastructure.

7. Policy Recommendations for Integrated Urban Energy Planning

To address the issue of institutional inertia and the gap between spatial expansion and energy security, policy needs to be transformed to less reactive supply management and more integrated and decentralized planning. It is recommended to use the following structures:

- **Zonal Energy Budgeting:** The national dispatching model needs to be decentralized to address the geopolitical import trap and the story of "macroeconomic helplessness." Utilities can move towards a model of unlimited

supply by assigning administrative zones a particular amount of energy quotas, depending on their density and economic output. This compels urban developers to make the new high-density projects cost-effective within budgetary constraints, which is direct pressure to the system to avoid imported costly fuels throughout the global market volatility.

- **Vertical Prosumer Cooperatives:** Dhaka needs to transform its towering structures into proactive sources of energy instead of working risks to overcome the problem of the spatialized risk of unplanned density. Creating legal frameworks to enable vertical cooperatives enable residents to co-own rooftop solar and neighborhood-scale battery storage. Such a localized generation will be capable of offsetting the growing grid demand projected by such agencies as Dhaka Electric Supply Company Limited to take advantage of vertical density instead of becoming a victim of it.
- **Metabolic Infrastructure Synchronization:** In order to remove the loop of retrospective correction and institutional friction, spatial planning and utility deployment should be combined into one layer of governance. With a single GIS-based digital twin, any city modification (e.g. highway widening or township development) must demand a simultaneous infrastructure permit, signed by all the utilities and town planning organizations such as RAJUK.

Lastly, the actualization of these structures necessitates transcending the preexisting bureaucratic silos. Creating a National Urban Energy Council with statutory powers to override the independent interests of RAJUK and the energy divisions is a step that needs to be taken to ensure that urbanization becomes an engine of -rather than a threat to - domestic energy security.

8. Conclusion

This paper clarifies that the current energy security crisis in Dhaka is not just a typical supply limitation and worldwide fuel prices but it is rooted in the structural disintegration of urban governance and energy management. The triangulation of qualitative utility discourse and spatial evidence is empirically confirmed in the fact that unplanned and fast urbanization has been able to systematically suppress existing infrastructural resilience. As a result, utilities find themselves stuck in the reactive policy environment, consistently seeking to match the spatial growth instead of anticipating and adapting to it. This institutional alienation greatly increases the reliance of the megacity on import-intensive, centralized energy sources, further increasing its susceptibility to external shocks, and undermining long-term energy security. Moreover, the results significantly highlight the shortcomings of conventional approaches to planning that alienate energy as an external input, instead of recognizing it as a key element of urban metabolism.

To address these structural weaknesses, this study recommends a radical change towards integrated and decentralized energy governance. Localized policy innovations, which include zonal energy budgeting, vertical prosumer cooperatives, and metabolic infrastructure synchronization can provide an efficient tool to align energy provisioning with spatial development. This paradigm shift would enable Dhaka to utilize its excessive density to develop localized energy sources, as a means of reducing the overall dependence of imported primary fuels. It has to be said, though, that the use of institutional documents has a methodological shortcoming; these papers might not accurately reflect informal processes or the specifics of everyday life. Primary data collection and strict techno-economic analysis need to be included in future studies to confirm the feasibility of the proposed frameworks. Finally, the processes of energy governance and urban planning should continue to be synergized in order to achieve sustainable and resilient urban development.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Data Availability Statement

The data supporting the findings of this study are derived from publicly available statutory annual reports published by the respective utility companies.

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