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Thesis title:

**Residents' Participation in the Energy Retrofitting
of Gijsing Flats**

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Summary

This thesis examined how policies guiding the renovation of Gijsing flats frame and influence resident participation in achieving energy efficiency. Using a single case study approach, the research examined how different forms of participation, nominal, instrumental, representative, and transformative, resulted in varying levels of resident involvement in the energy retrofitting of their housing units, impacting the energy efficiency outcomes.

The study finds that the four forms of participation (nominal, instrumental, representative, and transformative) had varying degrees of emphasis in the ‘Social Impact by Design’ and ‘Cooperation Agreement SOK BoTu’ policies. The overall dominant form of participation was instrumental, which led to tokenistic consultation and placation of residents. Nominal participation was the least emphasised, and did not lead to non-participation. Although representative and transformative participation were also present, they did not result into higher levels of resident participation. This research also finds that while compliance with energy regulations was achieved, residents’ participation had little influence on this outcome as their involvement was tokenistic. Additionally, this study establishes that tokenistic levels of participation did not result in a decrease in energy utility prices.

In conclusion, the thesis establishes that representative and transformative participation, as framed in policies, does not lead to meaningful resident involvement if there is a power imbalance between participants and decision-makers. Furthermore, when resident participation is limited to tokenism, regulatory obligations can still be met, when those in power are committed to compliance.

Future research should investigate whether enhancing participants’ capacities lead to more meaningful and higher levels of participation. Additionally, it could also investigate whether these higher levels of participation (partnership, delegated power, and citizen control) in energy retrofitting projects can lead to a reduction in energy utility costs.

Keywords

Resident Participation, Energy Efficiency, Forms of Participation, Levels of Participation

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Abbreviations

Abbreviation	Full form
BoTu	Bospolder-Tussendijken
EPBD	Energy Performance Building Directive
EU	European Union
IHS	Institute for Housing and Urban Development Studies
LTRS	Long Term Renovation Strategy
MLP	Multi-Level-Perspective
SNM	Strategic Niche Management
SOK	Samenwerkingsovereenkomst
TIS	Technological Innovation Systems
TM	Transition Management

Chapter 1. Introduction

1.1 Background

Climate change has an influence on energy demands for both cooling and heating (Yalew et al., 2020), with low-income households residing in low-energy efficient housing being disproportionately burdened by unaffordable energy prices (Jessel et al., 2019). Since the early 1970s, participation has been integral to low-income housing and urban development (Wakely, 2024). In Europe, participatory approaches are gaining recognition as solutions for addressing implementation issues in energy efficiency improvement (Van Dam et al., 2015). Breukers et al., (2017) noted that in the Netherlands, housing associations attempt to encourage active participation by residents to improve social housing neighborhoods, hence participatory approaches have gained popularity among Dutch policymakers.

To cut down on energy use and CO₂ equivalent emissions in buildings, the European Union (EU) introduced the Energy Performance of Buildings Directive (EPBD). This legislation aims to enhance building energy performance and reduce carbon emissions, mandating that all existing residential buildings achieve at least energy performance class E by 2030 and class D by 2033 (Economidou et al., 2020). The implementation of this regulation requires profound social and technical structural changes in the energy systems such as technological innovation,¹ infrastructure overhaul,² and behavioral shifts³ towards sustainable energy practices. Geels (2011) refers to such changes as sociotechnical transitions, and usually involve multiple actors. In view of the focus on the physical adaptations of the building stock to climate change, (Rodgers & Straub, 2015) notes that involving various actors in implementing various climate change adaptation measures within the housing sector is crucial for the Dutch social housing sector, since no housing association has the capacity to implement these measures independently.

In response to the EPBD requirement on resident participation, the Netherlands through its Dutch Housing Act requires social housing associations to obtain tenant approval before renovating more than ten housing units. Furthermore, the EPBD obligates the Netherlands to prepare a long-term renovation strategy (LTRS). This strategy can be seen as part of the technological innovation and infrastructure overhaul necessary for a sociotechnical transition, as it includes a range of measures to implement the energy transition in the built environment (Fig. 1). It aims to renovate existing buildings as cost effective as possible through a regional or district approach in which several buildings are made energy efficient. It points out initiatives such as subsidies and financing for making buildings energy efficient through deep renovation, aiming to combat energy poverty by targeting worst performing buildings. Use of modern technology, digitization of the construction process and building management, and education and training of specialists are some of the innovations it points out as necessary in transitioning towards energy efficient buildings (Netherlands Enterprise Agency, 2020).

¹ The EPBD introduces requirements on the installation of smart technologies in buildings to enhance their energy efficiency.

² The EPBD mandates that EU Member States develop long-term strategies to decarbonize existing buildings. It also requires EU countries to set cost-effective energy performance requirements for buildings undergoing significant renovations, including replacement or retrofitting of elements such as heating and cooling systems, roofs, and walls.

³ Sociotechnical transitions involve a change from one sociotechnical system to another, and are characterized by changes in the relations between actor groups.

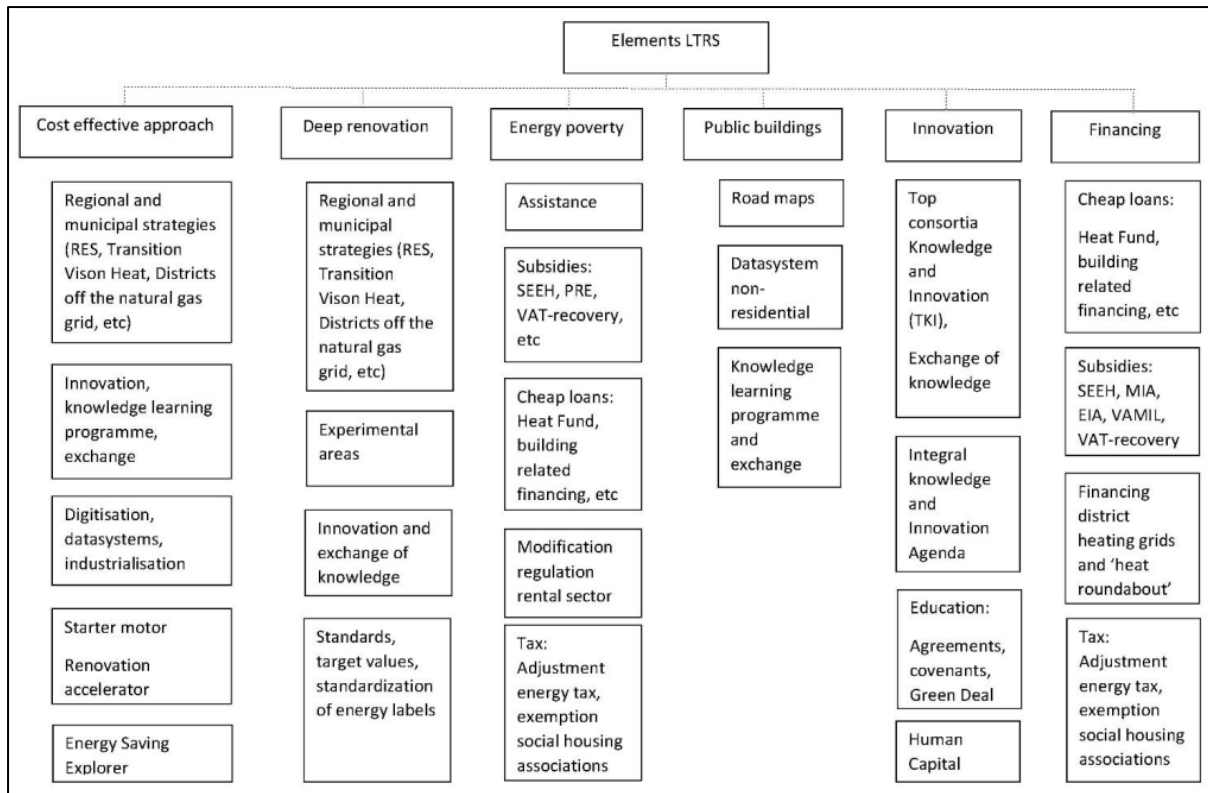


Figure 1: Dutch Long-Term Renovation Strategy – Source: (Netherlands Enterprise Agency, 2020)

1.2 Locus and Focus

The setting for this research is the renovation of Gijsing Flats in Bospolder-Tussendijken (BoTu) district of Rotterdam, whose social index⁴ was below that of Rotterdam as at the year 2018 (Gemeente Rotterdam, 2019). The renovation of Gijsing Flats, a social housing building, is part of the ‘Resilient Bospolder-Tussendijken 2028 Programme’. The programme aims to improve the social index of BoTu in helping its residents become sufficiently resilient to deal with changes in the context of energy transition and climate adaptation (Gemeente Rotterdam, 2019). This initiative aligns with broader European efforts to enhance housing energy efficiency, as outlined by the EPBD and the Dutch LTRS. The renovation of Gijsing Flats, consisting of 360 housing social rental units, took place from the year 2021 to 2022 (Fig. 2), with the goal of achieving an energy certification label A of all housing units through improving insulation and switching from gas to district heating, including installation of energy efficiency technologies (BAM Wonen, n.d.). Being part of the broader Resilient BoTu 2028 programme, this project was selected as the case study for this thesis since it stands as an example of policy implementation aimed at increasing housing adaptability to climate change through resident participation. Policies guiding resident participation in the renovation of Gijsing flats as a response to EPBD and Dutch LTRS include the ‘Social Impact by Design’ and ‘Cooperation Agreement SOK BoTu,’ both of which are the focus of this study. Additionally, given that BoTu is one of the poorest neighborhoods owing to its low social index (Gemeente Rotterdam, 2019),

⁴The social index is a measure indicating how neighbourhoods perform in terms of residents’ perception on quality of life. They are divided into 4 categories (capacities, participation, connectedness and living environment). Capacities include education level, income, health and debt. Participation entails residents’ social contact while connectedness refers to residents’ commitment and engagement in the district. The living environment refers to suitable housing (Gemeente Rotterdam, 2019).

it provides a unique context that is instrumental in addressing the research gap highlighted in the next section, the problem statement.

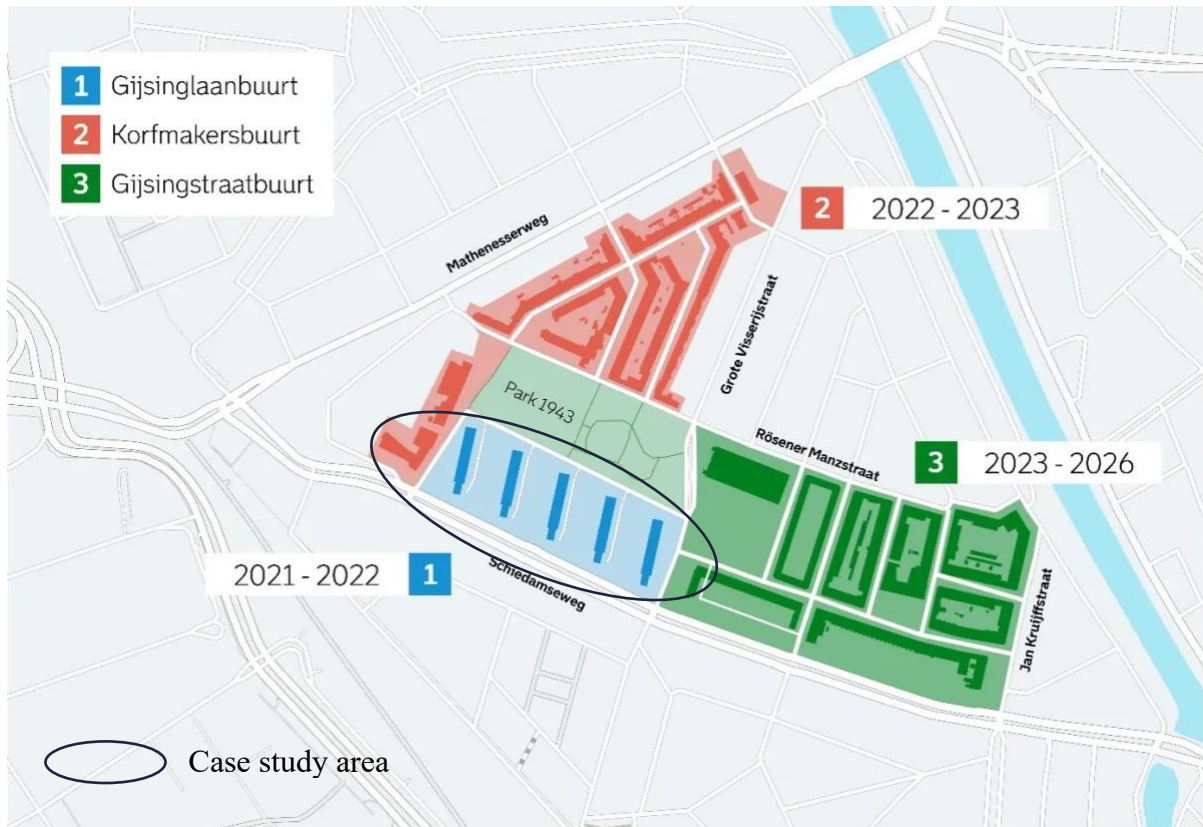


Figure 2: Case study area– Source: (Gemeente Rotterdam, 2020)

1.3 Problem Statement

One of the main drivers for undertaking building energy retrofits include energy conservation, cost reduction, and compliance with regulations (Menassa & Baer, 2014). The benefits of energy transition through which energy performance of buildings is enhanced through energy-efficiency retrofitting of existing housing stock, should take into account the affordability of the measures implemented. However, the Dutch rental market shows properties with higher energy efficiency typically command higher rent prices than less energy-efficient ones (Hillrichs et al., 2016), which contradicts with social housing residents' needs for cost-effective energy efficiency measures (Konstantinou et al., 2020).

Social housing residents have procedural concerns on how building renovations are taken with regards to how they are being informed and engaged in the process (Bal et al., 2021). Additionally, many deprived neighbourhoods with limited resources (finances, time) lack bottom-up initiatives where citizens collectively solve societal problems, but only occur with the support of external organizations. Despite extensive literature on bottom-up initiatives (Smith et al., 2016), Breukers et al., (2017) noted a gap in understanding how initiatives implemented by external actors can effectively foster local mobilization in deprived neighbourhoods where grassroots dynamics are absent or limited. While such initiatives can occur in deprived neighbourhoods owing to the support of external actors, the power relations between the initiators and local residents in decision-making raises questions on the quality of participation (Breukers et al., 2017). To address this research gap, this study aims to contribute to the understanding of how policies guiding the implementation of initiatives supported by external actors influence resident participation in achieving their key drivers of energy retrofits: energy cost reduction and regulatory compliance. In the context of this study, the 'Social Impact

by Design’ and ‘Cooperation Agreement SOK BoTu’ policies provide the framework for resident participation and engagement with other actors involved in the energy retrofitting process, making them the key policy documents under investigation.

1.4 Research Objective

The research seeks to explain how policies guiding the renovation of Gijsing flats frame and influence resident participation in achieving energy efficiency during the renovation process. This research takes framing of resident participation in both policies as the independent variable, with energy efficiency outcomes as the dependent variable. Residents’ level of participation during the decision making process is examined as the mediating variable.

1.5 Research Questions

1.5.1 Main Research Question

How do policies guiding the renovation of the Gijsing flats frame residents’ participation and thereby influence resident participation in the decision-making processes to achieve energy efficiency?

1.5.2 Sub Questions

1. How is resident participation framed in the ‘Social Impact by Design’ policy?
2. How is resident participation framed in the ‘Cooperation Agreement SOK BoTu’ policy?
3. What is the level of residents’ participation in the energy retrofitting of Gijsing Flats?
4. What are the energy efficiency outcomes of the renovated housing units of Gijsing Flats?

1.6 Relevance of the research topic

1.6.1 Scientific relevance

By drawing on the concepts of policy discourse and participation from Chapter 2, this study contributes to theoretical understanding of how framing of residents’ participation in policies influences how residents participate in practice. Additionally, it contributes to the body of knowledge in citizen participation as noted by Breukers et al., (2017), who claim the need for understanding how initiatives supported by external actors can effectively mobilize resident participation in deprived neighbourhoods.

1.6.2 Social relevance

By situating itself in the social housing context, where affordability is a key concern, this research aims to understand how external actors frame and influence resident participation through their policies. This understanding is crucial for designing programs that meet regulatory requirements and address community needs. The findings of this study therefore have significant implications for enhancing meaningful participation in social housing projects. Ultimately, these findings will enhance housing adaptability to climate change through energy retrofitting.

1.7 Scope and Limitations

The study focused on examining the framing of resident participation as a reflection of power dynamics between external actors and residents in the renovation of the Gijsing flats. The study was limited to assessing energy cost reduction and regulatory compliance as key indicators of energy efficiency. Additionally, while other factors may influence energy costs and compliance, the findings of this study are solely limited to explaining how resident participation impacts these specific outcomes.

Chapter 2. Literature review and hypotheses

This chapter focuses on the concepts and theories pertaining to the discourse on participation, and energy efficiency. Section 2.1 introduces the broader context of sociotechnical transition, within which this study situates itself (Fig. 3). Section 2.2 entails the concept of discourse as one of the dimensions of policy arrangements. Section 2.3 starts by introducing the concept of participation. It reviews the different forms of participation by showing the different interpretations of 'participation' held by both the participants and the initiators of the participation process. The different forms of participation discussed here serve as a reference of the different ways policies could frame participation. It also entails a review of the various levels of participation, highlighting the degree of influence/power participants have – from non-participation to citizen control. These levels of participation serve as a reference to the mediating role residents have on energy efficiency outcomes. Consequently, section 2.4 is a review of the residents' rationale or motivations in implementing energy efficiency measures. Lastly, section 2.5 concludes this chapter by presenting a conceptual framework that incorporates and visualizes the concepts discussed, showing how they are connected to each other.

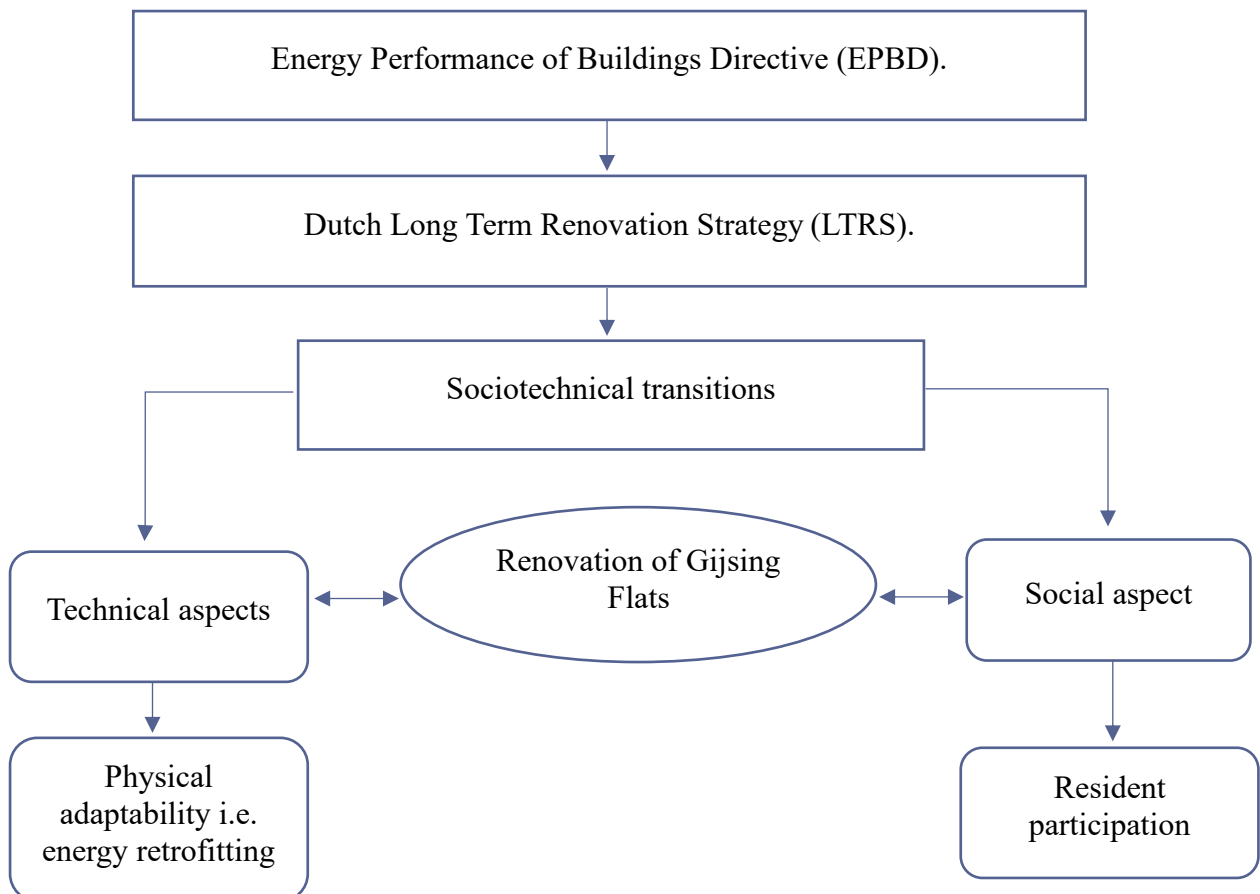


Figure 3: Context of the study

2.1 Sociotechnical transitions

Socio-technical transitions have garnered increasing attention within the social sciences, leading to the development of several conceptual frameworks for studying these processes (Markard & Truffer, 2008; Grin et al., 2010; Smith et al., 2010). Markard et al., (2012) conducted a review of scientific articles and noted that Transition Management (TM), Strategic Niche Management (SNM), Multi-Level Perspective (MLP), and Technological Innovation Systems (TIS), have been the main theoretical frameworks used in the understanding of socio-technical transitions.

Transition Management (TM) premises that sectors, such as energy, transport, or housing, are complex adaptive systems that require careful, coordinated efforts to shift towards more sustainable configurations. TM is valuable for guiding sustainability transitions through an iterative process that involves multi-stakeholder participation, often combining strategic visioning with practical, policy-oriented actions. The Netherlands has been recognized for successfully applying a TM approach in the energy sector (Negro et al., 2008; Kern & Smith, 2008). However, TM is not included in this study because it focuses on broad systemic changes by viewing sectors as complex adaptive systems. The scope of this research does not encompass the comprehensive systemic changes that TM typically addresses.

Strategic Niche Management (SNM) focuses on nurturing radical innovations within protected spaces (niches), allowing them to develop without immediate market pressures. However, the case under study, the renovation of Gijsing Flats, involves application of already developed innovations such as insulations and switching from gas to heat district heating.

Technological Innovation Systems (TIS) focuses on the development and diffusion of innovations. TIS frameworks emphasises on systemic factors influencing development and diffusion, by identifying enabling factors (e.g. supportive policies, strong networks and effective learning processes) and hindering factors (e.g. market failures, institutional resistance, and lack of resources). However, applying TIS would imply investigating factors influencing the development and diffusion of certain innovations, which is not the aim of this study.

The multi-level perspective (MLP) integrates multiple level of analysis, providing a view of how transition occurs through interactions among the regime (existing structures and practices), niches (innovations) and landscapes (broad societal contexts) (Geels & Schot, 2007). The MLP framework has been applied in various domains such as energy transition to explain the socio-technical change. This study situates itself within this multi-level perspective, since global commitments to solving climate change (landscape pressures) by driving the need for sustainable energy solutions. The MLP framework also allows this study to look into how established policies (regime) influences adoption of energy efficiency innovations (niches) in the transition towards energy efficiency buildings.

2.1.1 Multi-level Perspective (MLP)

Sectors such as energy supply, transportation or water supply can be conceptualized as socio-technical systems (Markard et al., 2012). These systems comprise networks of actors such as firms, individuals, collective entities and other organizations, as well as institutions, including regulations, societal and technical norms, and standards of good practice, along with knowledge and material artifacts (Geels, 2004). The MLP is rooted in the historical analysis of technological change, and concerned with the interactions between individuals or groups' capacity to act with purpose and structure across levels (niches, regimes, landscapes) (Fig. 4.) (Geels & Schot, 2007).

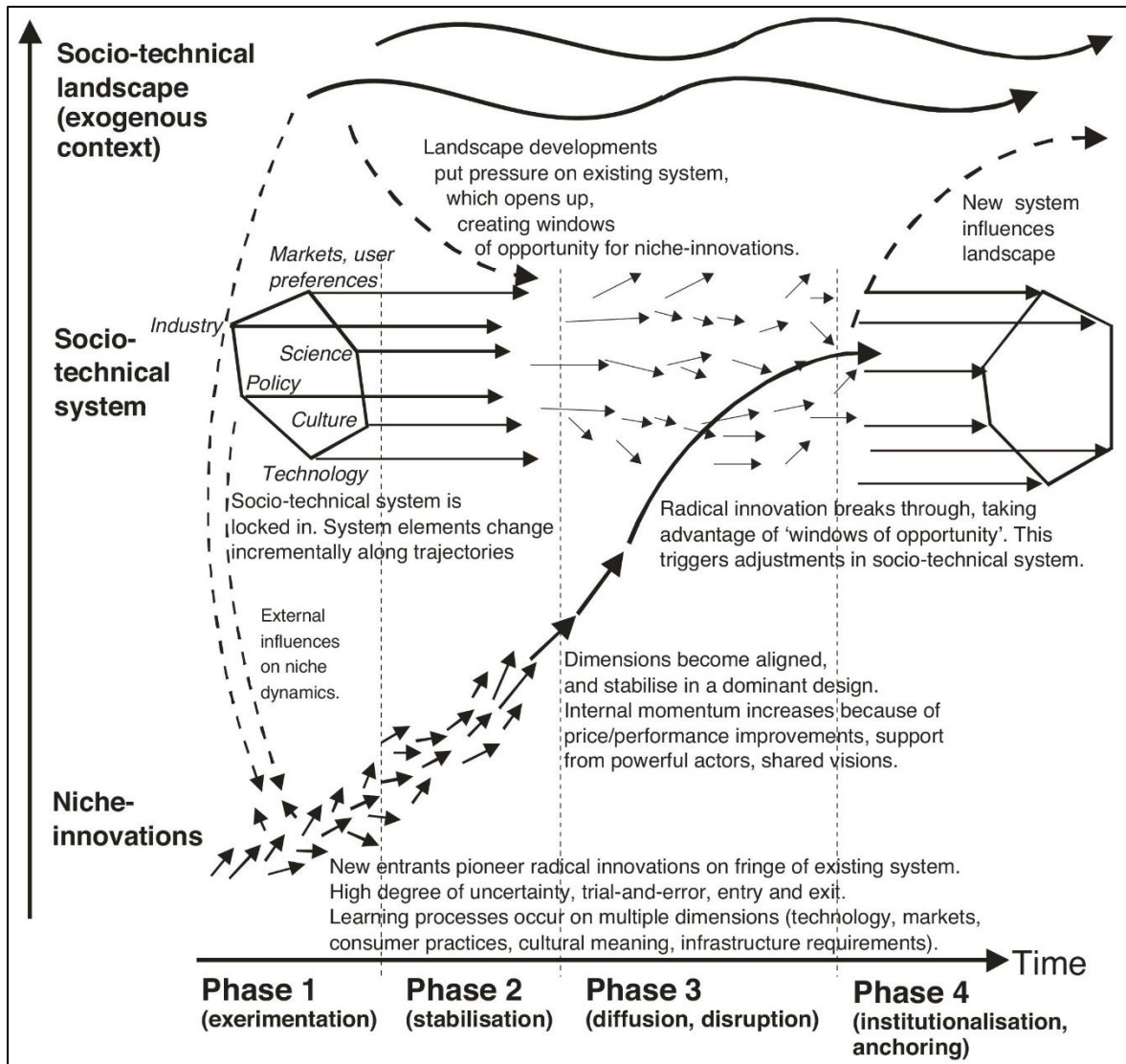


Figure 4: The transition process over time and across the three levels of MLP Framework (Geels & Schot, 2007, p.401).

In MLP, the transition from one socio-technical regime to another encompass a wide array of actors and involve significant changes across various dimensions, including socio-cultural, economic, technological, political, material, organizational, and institutional aspect (Markard et al., 2012). As depicted in Fig 4., external landscape developments may create pressure on the regime which consequently opens opportunity window for niche innovations to be adopted within the regime. However, for such transitions to occur, niche-innovations need to be fully developed, otherwise they cannot take advantage of these opportunities. Determining whether niche-innovations are "fully developed" is somewhat subjective, and niche actors may have different perceptions than regime actors. Geels and Schot (2007) highlighted that more than 5% market share and support by powerful actors could be indicators that niche innovations can stabilize and break through the regime more widely. The authors also noted that niche innovations have a dualistic relationship with the regime. It could be either a symbiotic or competitive relationship, with the former enhancing the competence of the existing regime by solving problems and improving performance, while the latter aiming to replace the existing regime. In these transitions, the MLP also emphasizes the multidimensional nature of agency, recognizing that actors are both rational and strategic, operating within the constraints and opportunities presented by existing rules, roles, and social networks.

Two endogenous processes of rule changes are identified: evolutionary-economic processes, where rules change indirectly through market dynamics, and social-institutional processes, where actors engage directly in negotiations to reshape these rules. Through activities such as sensemaking, negotiations, and coalition-building, actors exert influence over how these rules and practices are changed (Geels & Schot, 2007). The choice of transitional pathway entails competing problem definitions and narratives amongst actors with different interest. Geels (2011) argued that power struggles and discursive activities, such as debates, discussions, and the way issues are framed or communicated, deserve more focus or consideration. On that note, research drawing on discourse traditions aim to elucidate how actor groups use language to frame issues as they pursue their interest while attempting to guide the course of sociotechnical transition (Geels & Verhees, 2011; Smith & Raven, 2012; Munoz et al., 2014). The section below therefore entails discourse as dimension of policy arrangements.

2.2 Discourse as a dimension of policy arrangements

A policy arrangement consists of two main dimensions: content and organization (Arts et al., 2004). The content of a policy refers to how actors define and interpret the policy, while the organization refers to the coalitions of actors who share a common understanding of the policy content and who use their ability to mobilize resources to exert influence (Fig. 5). This dual focus on content and organization is particularly relevant to this study, as it allows for an in-depth analysis of how resident participation is both conceptualized (content) and operationalized (organization) within the broader context of socio-technical transitions.

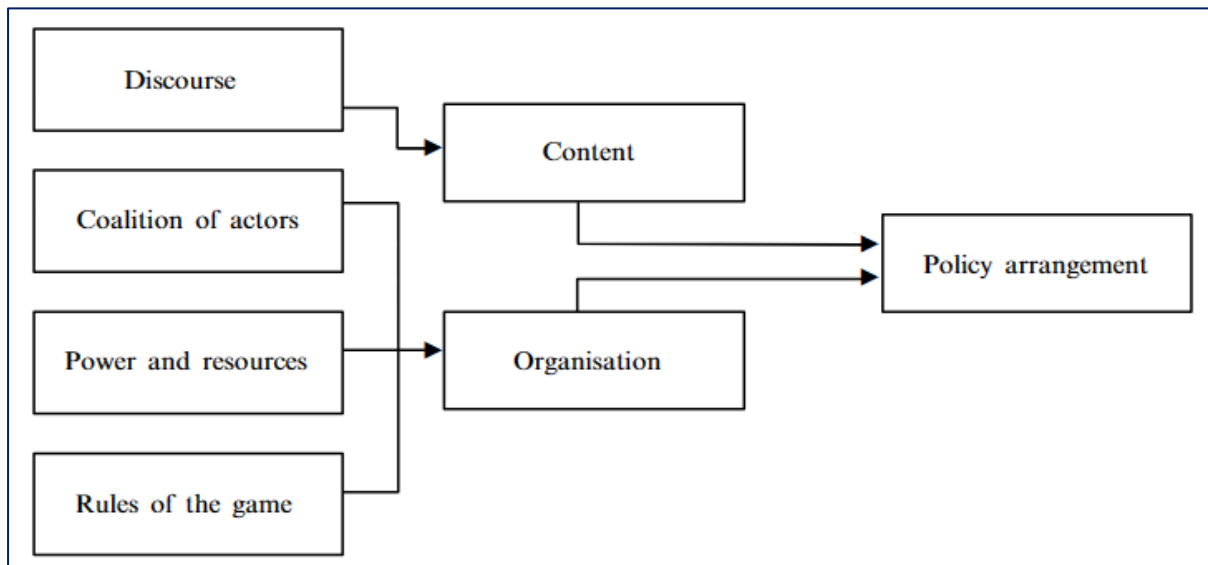


Figure 5: Dimensions of a policy arrangement (Wiering & Immink, 2006, p.425)

Discourse consists of three types: “(a) discourses that define reality and reflect actors' belief in the truth of certain propositions or the applicability of certain ideas (ontological discourses); (b) discourses that express desirable situations (normative discourses); (c) and discourses that give options for getting to the desirable situation (strategic, or 'route', discourses)” (Wiering & Immink, 2006, p. 425). Although this study does not restrict itself to a specific type of discourse within the case study, it adopts the definition of discourse as "dominant interpretative schemes, ranging from formal policy concepts to popular storylines, by which meaning is given to a policy domain" (Arts & Tatenhove, 2004, p.343). Adopting this definition allows this study to assess how formal policy documents give meaning to resident participation. Furthermore, Arts et al, (2000) states that the content and organization of a policy are interrelated and therefore affect each other. In other words, how actors define and interpret policy, affects how coalitions

of actors sharing the same understanding of the policy act to establish rules and use or acquire resources to exert influence during the implementation of the policy (Fig. 6).

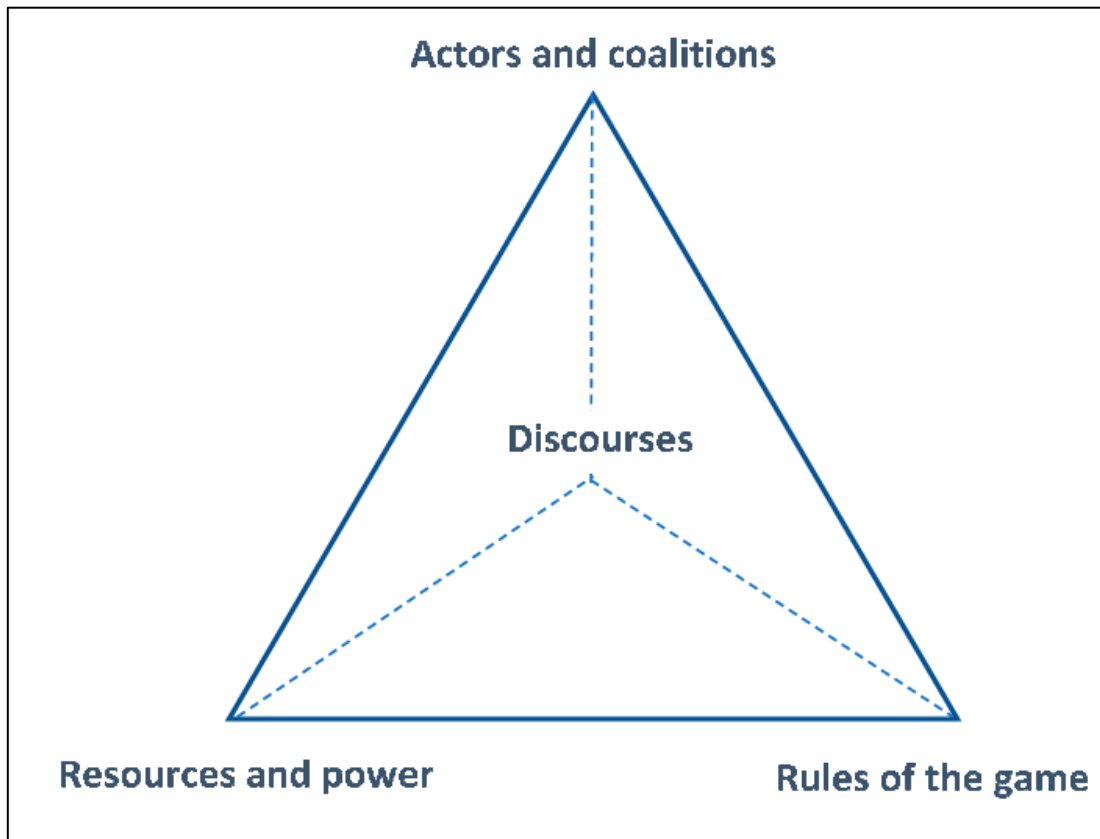


Figure 6: *Interconnectedness of the dimensions of a policy arrangement (Liefverink, 2006)*

Arts & Tatenhove (2004) linked resources to the concept of power, in which they referred to power as either the ability of actors to mobilize resources to achieve certain outcomes in social relations. The rules reflect the values of these actors (Wiering & Immink, 2006), since they highlight which norms are legitimate, agendas set; interests articulated; decisions made; and measures implemented (Arts & Tatenhove, 2004). On that note, by analyzing the policy discourse as a dimension of policy arrangement, this study is able to show how resident participation is framed in policy. Section 2.3 discusses the forms of participation as outlined by Sarah White (1996), highlighting the various interpretations of participation by those who initiate the process. These forms are crucial for this study, as they provide a framework for assessing understanding the different ways resident participation can be framed.

2.3 Social Aspect

Participation

Participation entered the development mainstream in the late 1970s, but its definition still remains elusive. As a result, various typologies of participation have been produced to differentiate the different kinds of participation. Most typologies have implicit assumptions that rank different types of participation from "good" to "bad" (Cornwall, 2008).

2.3.1 Typologies of participation

2.3.1.1 Sarah White's typology of participation

Sarah White's (1996) typology of participation is used by most studies to understand how people define or make use of participation (Cornwall, 2008). This typology is similarly important for this study, since policy discourse, one of the key elements of policy arrangements, entails how various issues are framed⁵. These four forms of participation include: nominal, instrumental, representative or transformative. The four forms of participation are not exclusive of each other, rather, they represent different ways in which individuals engage in participation. From an initiator's perspective (Table 1), they entail:

- participation as including citizens in the decision-making process to display legitimacy (nominal)
- participation as leveraging citizens local resources to increase the project's efficiency by limiting external input and enhancing cost-effectiveness (instrumental)
- participation as allowing citizens to voice their inputs and have an influence on the direction and management of the project (representative)
- participation as empowering citizens to enabling them to make their own decisions independently on a recurring basis (transformative)

Table 1: *Forms of participation* - Source: Adapted from Cornwall (2008, p. 273) in Sarah White (1996)

“Form	What ‘participation means to the initiator	What participation means for those on the receiving end	What participation is for
Nominal	Legitimation – to show they are doing something	Inclusion – to retain some access to potential benefits	Display
Instrumental	Efficiency – to draw on community's contributions and make projects more cost effective.	Costs in terms of time spent doing project-related tasks or	Means to achieving cost effectiveness and local facilities
Representative	Sustainability – to enhance self-dependency (avoid creating dependency)	To have leverage on the direction the project takes	Give people a voice in determining their own development
Transformative	Empowerment – enhance the capacity of people so that they are able to make decisions and take actions on their own.	Empowerment – making decisions and acting by themselves	Continuing dynamic serving both as a means and an end.”

⁵ Policy discourse applies to the content of a policy domain, as well as how players interpret and draw meaning from it (Wiering & Immink, 2006).

2.3.1.2 Sherry Arnstein's ladder of participation

Sherry Arnstein (1969) ladder of participation consists of eight levels of participation, with each level corresponding to the extent of power citizens have in affecting the outcome (Fig. 7).

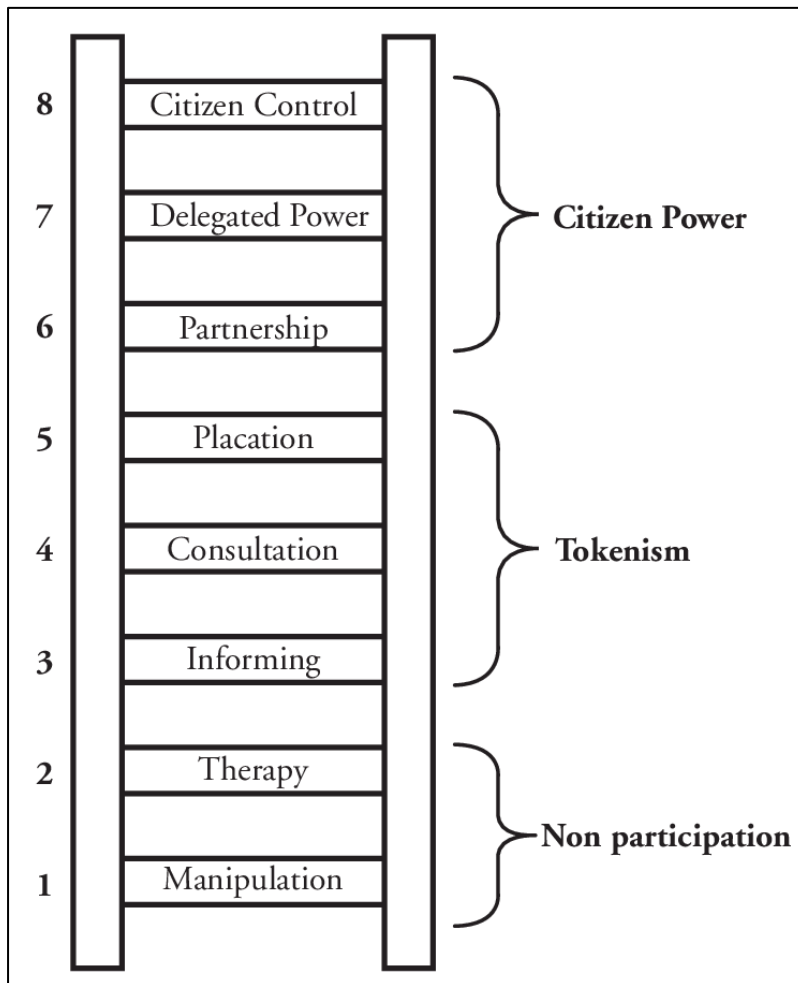


Figure 7: Ladder of citizen participation (Arnstein, 1969)

Arnstein's (1969) Ladder of Citizen Participation is a crucial framework for identifying the level of citizen participation, or the degree of power, in decision-making processes. Pre-determined decisions where citizens are merely persuaded to support decisions that have already been made serves as an indication of manipulation, which is the lowest rung of participation in Arnstein's ladder of participation. Similarly, therapy is categorized as non-participation. Those in power may perceive citizens as needing to be 'fixed', serving as an indication for therapy. She states that those in power assume citizens to be suffering from 'defects' and thus prescribe solutions to 'treat' them, rather than take into account citizens' opinions on issues affecting them.

Higher up the ladder is informing, which Arnstein claims to be the first step towards legitimizing citizen participation. However, she states that one-way communication from 'those in power' to the citizens (powerless) or lack of the opportunity to provide feedback or negotiate by the residents indicates tokenism, since citizens' inputs are not taken. Consultation, although regarded as much better form of participation by inviting residents' opinions through methods such as surveys or public hearings, could also be tokenistic since they don't guarantee consideration of people's opinions, ideas and concerns into decision making. Arnstein (1969) indicates that consultation as a form of tokenism may occur when it is not combined with higher

forms of participation in the ladder. Placation is regarded a much higher level of participation since it involves placing community representatives in decision-making roles. However, an indication of placation as a tokenistic means of citizens' participation is when citizens' representatives lack the real power, ability or influence to effectively represent community needs. Arnstein (1969) gives an example of advisory boards with limited or no powers to implement decisions or where citizen representatives are being outvoted by the majority members.

True participation, according to Arnstein (1969), begins with partnership, where power is more equally distributed, and citizens share decision-making responsibilities in structured frameworks like joint planning committees. Partnerships differ from the lower levels of participation, where initiatives are controlled (owned) by 'powerholders' that allow citizens varying degrees of influence. Joint control and shared 'ownership' where benefits and risks are mutually shared signifies partnership as a form of true participation. Acknowledging interdependence between actors could also serve as an indicator of citizens' genuine engagement.

Delegated power and citizen control are the highest levels of citizen participation, where as opposed to partnerships where there is joint multilateral control, citizens have unilateral control over particular functions. Arnstein's ladder of participation is therefore important for this study, as it provides key indicators for how residents participated. Nonetheless, a widely recognized critique for Arnstein's ladder of participation is Arnstein's framing of citizen participation as an overt struggle for power between government officials (them) and citizens. The criticism of Arnstein's ladder of citizen participation on having a primary focus on the power struggle between citizens and the powerholders is accurate, as Arnstein unapologetically tells the reader that she is being "provocative" in her account of citizen participation in the Model Cities Program to educate community groups about the Mickey Mouse (citizen participation) game (Arnstein, 1969). Nevertheless, the critique of Arnstein's ladder of citizen participation is important in the context of this study, since Geels (2019) explains that sociotechnical transitions are driven by various social groups who engage in various in a range of activities, including conflicts, power struggles, debate, negotiation, exploration, learning, coalition building, and goal-setting, all within frameworks of established rules and institutions, including norms and belief systems.

Taking this context into account allows the study to assess the level of citizen participation using Arnstein's indicators for non-participation, tokenism and citizen power. With respect to the varying levels of influence described by Arnstein's ladder of participation, this study therefore assesses how resident participation mediates the effect of participation framing on the achievement of energy efficiency outcomes. The success of energy efficiency schemes is closely tied to engaging with communities, tailoring measures to their needs, and addressing barriers such as poor information and low priority attached to energy efficiency (Long et al., 2015). The drivers or motivations for pursuing energy efficiency are discussed in next section below.

2.4 Technical Aspect

2.4.1 Energy efficiency

Literature on energy efficiency shows a diverse conceptualization of energy efficiency, and therefore its meaning varies depending on how it has been defined and applied both in research and practice across various fields (Dunlop, 2019). Historically, energy efficiency has been closely related to economic efficiency, and consists of:

- Technical efficiency relates to the ratio of input to output with emphasis on optimum combination of inputs to produce an output (Yotopoulos & Lau, 1973). A higher level of technical efficiency therefore means producing more energy output with the same amount of inputs or the same energy output with the fewer inputs through the most effective mix of inputs.
- Productive efficiency relates to the production of a unit of output at the least cost possible (Kopp, 1981). Therefore, the goal is to minimize the cost of energy production, implying that producing one unit of energy should incur the least cost possible.

Based on the above understanding of energy efficiency as it relates to economic efficiency, Dunlop (2019) submits that technical efficiency (resource optimization) could be a means to achieving productive efficiency (cost savings). Building on that, this study assesses the degree of influence residents had on the choice of technical efficiency aspects with the aim of achieving their underlying motives for participating in the energy retrofitting process. Section 2.4.2 thus provides a review of the factors driving the need to enhance energy efficiency, including the associated technical considerations.

2.4.2 Motives/Rationale for improving energy efficiency in buildings.

2.4.2.1 *Environmental arguments (energy conservation)* –

Depleting energy resources and increased demand for energy are some of the reasons for improving energy efficiency in buildings (Pérez-Lombard et al., 2008). Some of the major measures for enhancing energy conservation in buildings involve reducing energy consumption through: passive building design; use of low-embodied energy materials; integration of renewable energy technologies in buildings and use of energy efficient appliances (Chel & Kaushik, 2018). Existing buildings can be integrated with the principles of passive building design to enhance their energy efficiency through renovating their design (Aksamija, 2015). General building design can influence energy use up to 32% (Raji et al., 2017), with factors like window-to-wall ratio and number of rooms, (Poor et al., 2018), shape and orientation (Pacheco et al., 2012), playing a significant role.

Energy conservation can also be achieved by integrating renewable energy into buildings (Chel & Kaushik, 2018). For instance, a significant portion heat and electricity demands of buildings can be generated using photovoltaic panels. Solar energy systems can be seamlessly integrated into buildings to address heating, cooling, electricity, and lighting needs. The facades, as well as the horizontal or inclined roofs of buildings, provide suitable surfaces for extensive use of solar panels (Tripanagnostopoulos & Tselepis, 2003).

2.4.2.2 *Economic arguments (energy cost reduction)* –

There are cost savings when energy efficiency improves and results in a lower energy bill for the same amount of energy consumed (Ryan & Campbell, 2012). Past research shows energy cost reductions associated with various types of energy efficiency systems, for both new construction applications and renovations:

a) Savings on heating cost during winter

Savings cost on heating during winter can be achieved by reducing heat loss through insulation of heating pipe networks, wall insulation and use of double-glazed windows (Memon, 2014 ; Shen et al., 2017; Urbikain, 2020 ; Shen et al., 2017). These measures improve the thermal insulation performance of building envelope, and the indoor temperature can meet the

residents' comfort level, cutting down the expenses for electricity heating. Such economic benefits are reflected in the direct reduction of energy consumption, and therefore decreased energy costs (Clinch & Healy, 2001).

b) Savings on cooling cost during summer

Applying energy retrofitting measures can result in lower air conditioner operating costs during the summer (Clinch & Healy, 2001). Energy-efficient retrofits such as integrating natural ventilation in buildings, shading, and use of double-glazed windows with low-emissivity to reduce solar heat, and insulated, can reduce energy demands for cooling gain (Fu et al., 2017; Koo et al., 2017).

2.4.2.3 Compliance with regulation

In 2008, the EU Energy Performance of Buildings Directive (EPBD) was put into effect in the Netherlands. Every EU member state is mandated by EPBD to establish buildings' energy performance certification. Mandatory energy labels have a big impact motivate stakeholders in the Dutch housing sector to renovate their houses towards improved energy efficiency (Greco et al., 2016). A subsidy mechanism exists to promote housing associations to improve energy efficiency in social housing units. The Energy Performance Incentive Scheme (*Stimuleringsregeling Energieprestatie Huursector*) is an example of a subsidy program that provides subsidies to increase the energy efficiency of social housing. The table (2) below shows the energy labels used in evaluating buildings' energy performance in Netherlands.

Table 2: Dutch energy certification labels

Energy Label	Energy Index	Mean actual primary energy consumption (Kwh/m²/year)
A (A+, A++)	<1.05	138.48
B	1.06 – 1.3	162.08
C	1.31 – 1.6	174.27
D	1.61 – 2.0	195.60
E	2.01 – 2.4	211.55
F	2.41 – 2.9	223.83
G	>2.9	232.10

Source: (Filippidou et al., 2016)

Residential buildings are rated using a hierarchy label of energy efficiency classes, ranging from A++ to G, with A++ being the most energy efficient and G being the least energy efficient. The energy label class for each residential housing is determined by calculation model based on power use, gas consumption, and carbon dioxide emissions per unit area. A higher energy class label therefore indicates reduced power and gas usage, as well as carbon emissions per unit of space.

2.5 Conceptual Framework

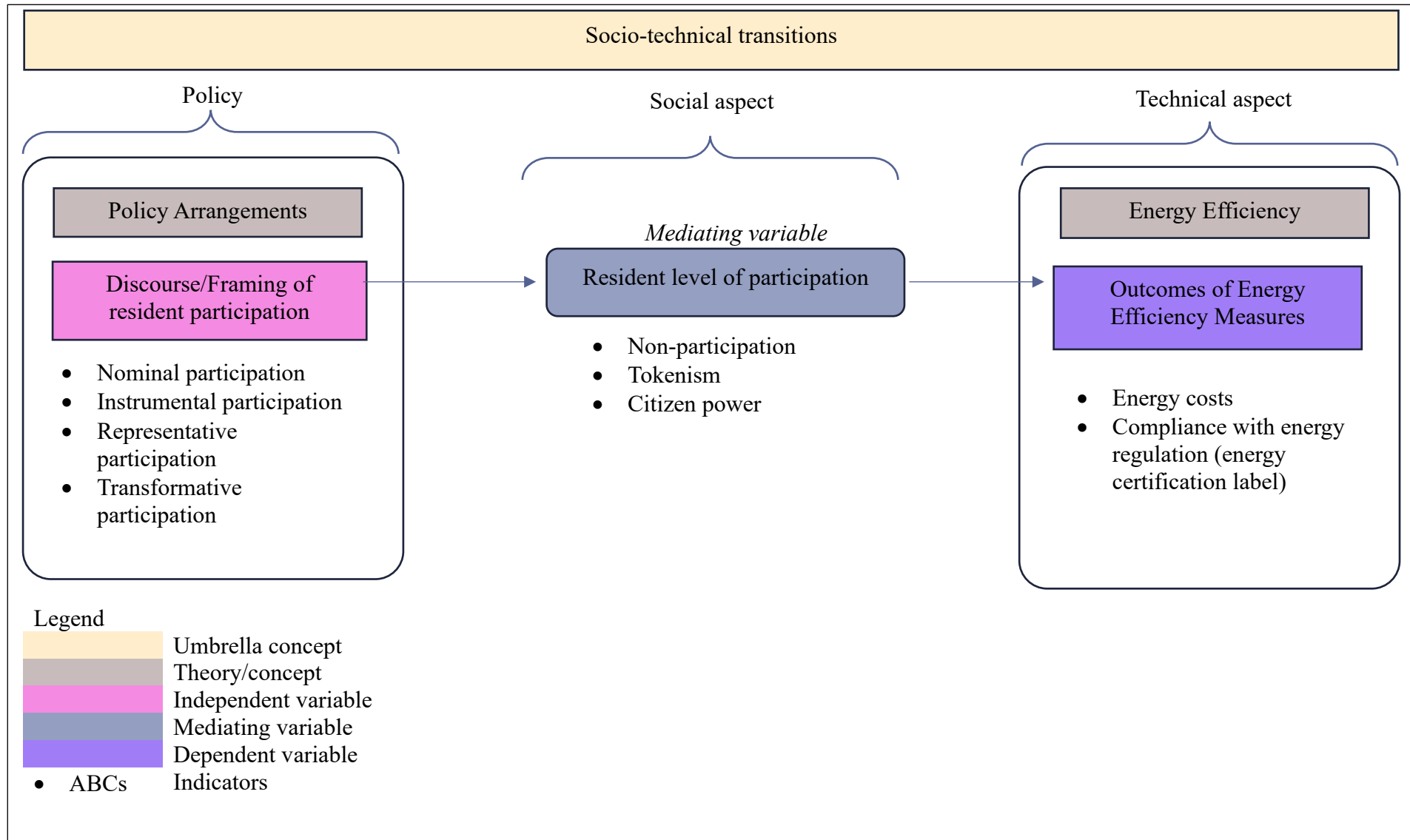


Figure 8: Conceptual framework

The conceptual framework above (Fig. 8) shows the relationship between the independent variable (framing of resident participation), mediating variable (residents' level of participation) and dependent variable (outcomes of energy efficiency measures/retrofitting) within the broader socio-technical transitions. To assess the framing of resident participation in policies, the conceptual framework uses Sarah White's (1996) forms of participation (nominal, instrumental, representative and transformative) as references of how participation can be framed. This study assumes that the framing of resident participation influences residents' degree of influence i.e. their level of participation. To determine residents' level of participation, the conceptual framework uses Arnstein (1969) ladder of participation (non-participation, tokenism and citizen power) as the indicators. This levels of participation in turn influence the achievement of energy efficiency, where energy cost reduction and regulatory compliance are used as the indicators. To analyse this relationship, an analytical framework (Table 3) shown in the next section 2.6 below was developed to assist in analysing and discussing the results after data collection. It depicts that different Sarah White's (1996) different forms of participation (framing) leads to different levels of participation, therefore having varying degrees of impact on achieving energy efficiency.

2.6 Analytical Framework

Sarah White's framework categorizes participation into four forms, each reflecting the purpose and intent behind engaging participants. Arnstein's ladder, on the other hand, categorizes participation based on the degree of power participants have in influencing decision-making. On that note, an analytical framework (Table 3) was developed to assist in analysing the relationship between the independent, mediating and dependent variables shown in the conceptual framework (Fig 8).

Table 3: Analytical Framework

Sarah White forms of participation	Arnsteins' levels of participation	Energy efficiency outcomes
Nominal	Non-participation (Manipulation and Therapy)	Low
Instrumental	Tokenism (Informing, Consultation, Placation)	Low to Moderate
Representative	Partnership	Moderate
Transformative	Delegated power and citizen control	High

The analytical framework (Table 3) depicts that:

- Sarah White's Nominal Participation aligns with Arnstein's lower rungs of Manipulation and Therapy. Both frameworks describe a situation where participation is more about appearance than substance, with no real influence granted to participants.
- Instrumental Participation is aligned with Arnstein's Tokenism (Informing, Consultation, Placation). Here, participants are involved, but the primary goal is to achieve project efficiency or fulfil specific objectives rather than to genuinely empower participants. The level of power granted to participants is limited, and their involvement is often controlled by those in authority.
- Representative Participation is aligned with Arnstein's middle-to-higher rungs of Partnership, where participants have equal degree of influence and power in decision-making. They are consulted, and their opinions matter, but they might not have full decision-making power.

- Sarah White's Transformative Participation is aligned with Arnstein's highest levels of participation (Delegated Power, Citizen Control), where participants are fully empowered. In both frameworks, participants are not just giving input but are central to decision-making, capable of driving social change and having significant influence over outcomes.

A scoring scale (appendix 5) was used to analyse the relationship between the participants' level of participation on the energy efficiency outcomes. It is based on the premise that different levels of participation will result in varying degrees of energy compliance and cost reduction:

- Non-participation will lead to energy efficiency outcomes, leading to low energy compliance and energy cost reduction.
- Tokenism will lead to limited to moderate energy efficiency outcomes, resulting in low to moderate energy compliance and cost savings.
- Partnership will lead to moderate energy efficiency outcomes, achieving moderate energy compliance and cost reductions.
- Delegated power and citizen control will lead to high energy compliance and energy cost reductions.

Chapter 3. Research design, methodology

This chapter outlines the research design and methodology employed in this study, providing a detailed description and justification of the selected strategy, methods, and techniques used to address the research questions. It also contains a description of the sample (i.e. selected respondents), including the criteria used to select this sample. An explanation of how data will be analysed to answer the research questions is also provided.

The main question guiding this research is: “How do policies guiding the renovation of the Gijsing flats frame resident participation and thereby influence resident participation in the decision-making processes to achieve energy cost reduction and regulatory compliance?” To answer this question, the study draws on a theoretical framework that defines the key concepts of policy discourse, resident participation, and energy efficiency outcomes. The primary variables include the framing of resident participation (independent variable), levels of resident participation (mediating variable), and energy efficiency outcomes (dependent variable). This study draws on Sarah White's (1996) four forms of participation (nominal, instrumental, representative, and transformative) as indicators to analyse and identify the discourse and framing of resident participation within the policy documents. Arnsteins' (1969) levels of resident participation (citizen power, tokenism and non-participation) are used as the indicators for explaining resident participation. Additionally, cost of energy utility and building energy performance certification labels are used as indicators for measuring energy efficiency.

3.1 Research Design: Qualitative

The research questions and conceptual framework translate best into a qualitative research design. The first research sub-questions necessitates a qualitative approach, as policy discourse entails the interpretation of language and meanings embedded within text (Gasper & Apthorpe, 1996). Additionally, qualitative research seeks to “address questions concerned with developing an understanding of the meaning and experience dimensions of humans' lives and social worlds.” (Fossey et al., 2002 p. 717). This epistemological standpoint is referred to as interpretivist, and it examines participants' interpretations from a social constructionism point of view (Becker et al., 2012). Illuminating the subjective meanings of participants is one of the most important elements of qualitative research (Fossey et al., 2002). On that note, a qualitative research design was selected to gather insights from respondents about residents' level of participation and experiences with energy efficiency, particularly in relation to energy utility bill costs and compliance.

3.2 Research Strategy: Case study

A single case study allows a qualitative analysis of selected events (Yin, 2003). This approach concentrates all the research efforts on a single phenomena or unit, allowing for a thorough examination and comprehensive account of that particular case (Bowen, 2009). As a result, the renovation of Gijsing Flats in Bospolder-Tussendijken is selected as a case study as it provides a relevant research context needed for addressing its research questions. While this methodology may restrict generalizing the findings, the objective of this thesis is not generalization. Therefore the findings of this research apply only to this case study or similar contexts. The nature of this study is explanatory, as it aims to explain how policies guiding the renovation of Gijsing flats frame resident participation and therefore influence resident participation in achieving the key drivers of energy retrofits: energy cost reduction and regulatory compliance. Consequently, the individual renovation project (Gijsing flats) and the associated policy documents is the appropriate unit of analysis for this study. Analyzing the Gijsing flats as a case study allows this research to explore the interaction between policies, resident participation, and outcomes in a specific, real-world setting.

3.3 Data Collection Instruments

This study collected both primary and secondary data as follows:

3.3.1 Primary data collection

Research instruments used to collect primary data were:

- 1) Structured questionnaires: Questionnaires consisting of closed ended questions were administered to 31 residents to gather data on their level of participation.
- 2) Focus group discussion: A focus group discussion consisting of five residents was conducted to gather a range of insights related to their participation in the energy retrofitting process, as well as energy efficiency regarding their energy utility costs.
- 3) In-depth interview: A semi-structured set of questions was used to guide the interviews, enabling the collection of detailed insights into residents' participation and energy efficiency. A total of four interviews were conducted, out of which three were with local residents and one was with a representative from the Municipality of Rotterdam.

3.3.2 Secondary data collection

A document review from the Municipality of Rotterdam's website was done to extract documents framing residents' participation in the energy transition of to the residents' participation in the Bospolder-Tussendijken neighbourhood district (BoTu Wijk). Several key documents, including various planning and strategy documents were identified. The 'Social Impact by Design' policy and the 'Cooperation Agreement SOK BoTu,' were selected due to their focus on participation.

3.4 Unit of Analysis

Analysing the Gijsing flats as a case study allows this research to explore the interaction between policies, resident participation, and outcomes in a specific, real-world setting. In that regard, the appropriate unit of analysis for this study entailed the individual renovation project (Gijsing flats) and the associated policy documents ('Social Impact by Design' and 'Cooperation Agreement SOK BoTu').

3.5 Sample size and selection

The study included 31 participants who completed the closed-ended questionnaires, 4 participants for in-depth interviews (1 staff member from the Municipality of Rotterdam and 3 residents), and a focus group discussion comprising 5 residents. All residents who participated in the data collection either through questionnaires, interviews or focus group discussion were sampled from the total population of 360 residents living in the Gijsing flats. Purposive sampling is advantageous when a research requires participants with specific experiences to align with the research objective (Bernanda et al., 2022). On that note, purposive sampling was employed in this study to specifically target respondents who were involved in the energy retrofitting process of the Gijsing flats.

3.6 Reliability and Validity

Reliability refers to the probability that repeated operations will produce similar outcomes (Yin, 1994). According to the author, reliability is intended to minimize the magnitude of errors in the study. To ensure the reliability of the data collection, the questionnaire guidelines were carefully developed with great attention and precision. A pilot test of the questionnaire was administered amongst with a small group of individuals not involved in the study to ensure clarity of the questions and overall flow of the questionnaire before conducting the full-scale study. Triangulation entails combining two methodological approaches or sources to enhance the validity of the research findings (Thurmond, 2001). This study therefore employed two

other methods of data collection (focus group discussion and interviews) to ensure validity of the information obtained (Fig .9)

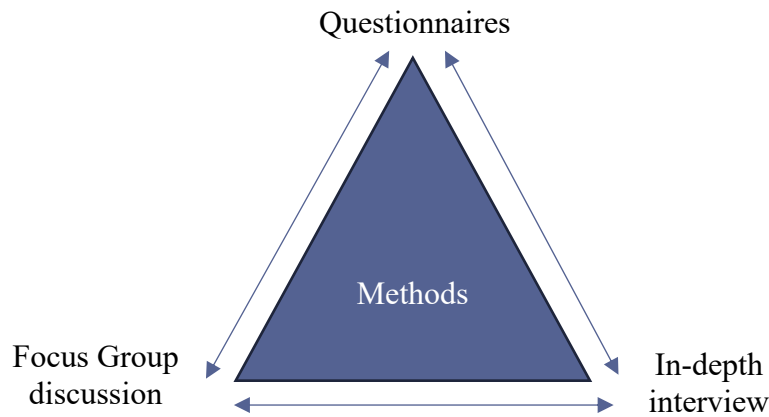


Figure 9: Triangulation (Source: Author, 2024)

3.7 Data Analysis Methods

The secondary data obtained from policy documents through the document review was analysed using thematic analysis. Thematic analysis helps identify recurring patterns and themes (Alhojailan, 2012), making it suitable for this study because it revealed how resident participation is “presented” or framed. Explicit coding was adopted during the analysis. Each segment of the text that discusses resident participation was coded according to whether it reflects nominal, instrumental, representative, or transformative participation, as defined by Sarah White (1996). Discourse analysis was also used to identify the power dynamics within the framing of participation within the policy documents. Discourse analysis refers to how language is used by people to make meaning and communicate, and can be used to reflect how power dynamics are enacted (Delmas & Giles, 2023). Discourse analysis considers how interpretations of meaning influence rather than merely reflect social life (Manzi, 2012), making it useful to explain how the framing of participation may have influenced the level of influence residents had in the energy retrofitting process.

Data from the structured questionnaires was analysed using Excel. Descriptive statistics, such as frequencies and percentages, were used to summarize the data. The data was processed and analysed using Microsoft Excel software.

The qualitative data collected from focus group discussion and in-depth interviews was analysed using thematic analysis. This method involved coding the data to identify recurring themes, patterns, and insights. Thematic analysis helped to uncover the experiences of the resident participation, including energy utility costs and compliance with energy labels as expected outcomes of energy efficiency retrofitting process. ATLAS.ti was used to organize and analyse the qualitative data.

3.8 Operationalization: Variables, indicators

The principles from the conceptual framework given in Chapter Two have been operationalized by converting them into measurable indicators that are applicable and easily comprehended by the respondents. The indicators were used in formulating questions for primary data collection asked through different instruments (questionnaires, interview schedules, and focus group discussions etc.). For secondary data analysis, the operationalization from concept to indicator was helpful in coding the policy texts. Table (4) shows the operationalization used in this study.

Table 4: Operationalization Table

Research Question	Concept/ Variable	Conceptual definition	Operational Definition	Indicators		Source of data
How is resident participation framed in the ‘Social Impact by Design’ policy?	Policy discourse	Refers to the way in which language is used in written text or spoken communication to construct meaning, convey ideas, or represent social realities	Themes used in policy text to present or convey the meaning of resident participation along with the underlying power dynamics that shape and influence the interpretation and implementation of that participation.	Nominal	Participation as involving residents with the main goal of displaying legitimacy.	Policy documents (Social Impact by Design, and Cooperation Agreement SOK BoTu)
instrumental				Participation as a means of achieving projects’ efficiency by involving residents in a task-oriented manner.		
Representative				Participation as a way of inviting residents’ opinions to shape the direction or management of the project.		
How is resident participation framed in the Cooperation Agreement SOK BoTu’?				Transformative	Participation as enhancing the capacity of residents so that they are able to take actions independently and autonomously	
What is the level of residents’ participation in the energy retrofitting of Gijssing Flats?	Levels of resident participation	Degree of power citizens have in influencing decision-making processes	Influence residents have in decision-making processes with regards to energy efficiency measures	Non-participation	(1) Residents’ involvement to endorse already made decisions. (2) Initiatives aimed at changing residents’ opinions without addressing their real concerns	<ul style="list-style-type: none"> • Surveys (questionnaire) • In-depth interview • Focus group discussion • Secondary data (video transcript)
Tokenism				(1) One-way communication without avenues for residents’ feedbacks (2) residents opinions are asked but final decisions do not reflect their inputs (3) Involvement of residents or their representatives in decision making		

					committees but their recommendations are not adopted	
				Citizen power	(1) Decisions are made with equal input from residents and other stakeholders (2) Residents having final decision making authority (3) Autonomous independent control by residents	
What are the energy efficiency outcomes of the renovated housing units of Gijsing Flats?	Energy efficiency	Aligns with the concept of technical efficiency (resource optimization), as a means of achieving productive efficiency (cost savings)	Outcomes of the energy efficiency measures implemented during the renovation process	Energy costs savings	Change in the energy utility bills	<ul style="list-style-type: none"> • Surveys (questionnaire) • In-depth interview • Focus group discussion
				Compliance with energy regulation	Energy certification label	<ul style="list-style-type: none"> • Surveys (questionnaire) • In-depth interview • Focus group discussion

3.9 Challenges and limitations

3.9.1 Challenges

Access to participants in this study was constrained by several factors. First, willingness to participate varied, with some residents hesitant to engage in the study. Additionally, availability was a significant issue, as many participants were not at home during daytime hours, limiting opportunities for contact. Socio-cultural factors also played a role; in some cases, residents required the consent of their spouse before agreeing to participate, which further restricted involvement.

Data collection through online questionnaires presented its own set of challenges. Many residents were reluctant to open the link or scan the QR code due to concerns about web security. As a result, paper questionnaires were distributed instead. Language barriers presented a significant challenge, as most respondents were fluent only in Dutch or Arabic, while the author was not proficient in either language. To address this, a Dutch-speaking assistant was trained and familiarized with the research aims and concepts to help with data collection. However, some potential respondents, particularly those with an immigrant background, were unable to understand Dutch. Where possible, interviews were conducted in English. These challenges resulted in having only 31 respondents completing the questionnaire. The number of respondents (31) who completed the questionnaire is not representative of the whole population (360). To address this limitation, archival records were sought to provide additional context and insights into how residents' participation was conducted. A transcript of a panel discussions involving key stakeholders (i.e. Municipality of Rotterdam, a representative from the Natural Gas-Free Neighbourhoods Program and a representative from Platform 31) was used to provide more information regarding resident participation in the energy transition of Bospolder-Tussendijken district. Additionally, to ensure the reliability and validity of the findings, multiple data sources were employed through triangulation, where interviews and a focus group discussion was conducted to cross-check and validate the information obtained.

3.9.2 Limitations

The study focuses on the Gijsing flats renovation within the context of the 'Social Impact by Design' and 'Cooperation Agreement SOK BoTu' policies. It looks into how resident participation is framed and how it influences project outcomes related to energy efficiency, cost reduction, and compliance with regulations. The study does not cover other aspects of the renovation process that fall outside the scope of resident participation, such as global or regional policies, or external economic factors influencing the outcomes related to implementing energy efficiency measures in housing.

Chapter 4. Results, analysis, and discussion

4.1 Introduction

This chapter presents the findings obtained for each research sub-question, their analysis and discussion. Section 4.2 begins by presenting the findings of the first research sub-question, which entails how residents' participation is framed in 'Social Impact by Design Policy' and 'Cooperative Agreement SOK BoTu' policies. It also presents the levels of residents' participation as the findings for the second research sub-question, while energy-efficiency outcomes are presented as findings of the third research sub-question. The data sources detailed in sub-section 4.1.1, together with the literature discussed in chapter 2, have been utilized to explain the findings in this chapter. This chapter includes summary findings for each research sub-question. It then ends with section 4.3, which is an analysis and discussion of the findings, explaining how framing of resident participation in policies influences residents' level of participation, consequently influencing energy efficiency outcomes.

4.1.1 Data sources

4.1.1.1 Primary data sources

Data on residents' participation levels and energy efficiency outcomes were collected through questionnaires, interviews, and a focus group discussion, as summarized in the table 5 below.

Table 5: Primary data sources.

Method	Variants	Number of respondents	Specifications
Questionnaire	Online and paper questionnaire with closed-ended questions	31	5 residents filled in the online questionnaire 26 residents filled in the paper questionnaire
Interviews	Semi-structured interviews	4	3 residents 1 representative from the Municipality of Rotterdam
Focus group discussion	1 focus group discussion	5 residents participated in the focus group discussion	

4.1.1.2 Secondary data sources

The 'Social Impact by Design' and 'Cooperation Agreement SOK BoTu' policies were used as the secondary data sources to obtain findings on how residents participation is framed. These policies guide the efforts aiming at improving the resilience of Bospolder-Tussendijken district, calling upon the involvement of residents in these initiatives. The renovation of Gijsing Flats is among the initiatives within the Bospolder-Tussendijken district that involve residents, along with other stakeholders such as the Municipality of Rotterdam and Havensteder housing association. Additionally, a video recording of a discussion about stakeholders' participation in the process of making neighbourhoods gas-free and energy efficient

through retrofitting of buildings was used to supplement findings from the primary data sources. Table 6 below shows a summary of the secondary data sources used.

Table 6: Secondary data sources

Secondary data	Description
Social Impact by Design	Aims at finding structural solutions that make the Bospolder-Tussendijken district resilient through collaboration with the private sector (market), society (local residents) and the government
Cooperation Agreement SOK BoTu'	Outlines a collaborative effort between BoTu residents, local initiatives, entrepreneurs, the municipality, Havensteder housing corporation, and the energy company Eneco.
Video recording organized by Programma Aardgasvrije Wijken	Transcript of a discussion of stakeholders' participation in the transitioning neighbourhoods to be gas-free and energy efficient. The discussion was between: <ul style="list-style-type: none"> • A representative from the Municipality of Rotterdam working on the social aspect of the energy transition within the Bospolder-Tussendijken district. • A representative from the Natural Gas-Free Neighbourhoods Program • A representative from Platform 31: an organization that brings together stakeholders and investigates social problems affecting cities.

4.2 Presentation of Findings

RQ. 1. How is resident participation framed in the 'Social Impact by Design' policy?

a) Thematic Analysis Findings

Overview

Table 7: Distribution of Resident Participation Themes in the Social Impact by Design Policy Document

		PDF 2: social impact by design 43	Totals
Instrumental Participation	4 30	19	19
Nominal participation	2 10	6	6
Representative Participation	2 21	9	9
Transformative Participation	4 15	9	9
Totals		43	43

The (table 7) above shows that instrumental participation is the most recurrent theme (19 occurrences) indicating that participation as a tool to achieve the objectives pursued by the projects' initiatives was the most emphasised. By taking a neighbourhood approach, the collective effort of various stakeholders are geared

towards achieving the projects' goals on making the neighbourhood energy efficient and gas-free. This form of participation stems from rational choice as it stems from the idea of resource mobilization to achieve economies of scale.

Representative participation, where participants have a voice in guiding the implementation of the project, and transformative participation in which participants are empowered to find solutions within themselves and drive change, were equally observed (9 occurrences each). This indicates a balance of framing resident participation wherein residents are empowered to find solutions and act towards making their neighbourhood more resilient, while also giving them a voice on how the transition should occur. By framing participation as representative, the policy aims to ensure that even residents who appear or could be marginalized have an influence on the direction the project takes. Equally, having residents as active agents of change, where they lead the energy transition is indicated by the framing of participation as transformative, in which their capacities are enhanced.

Nominal participation, referring to participation as a way of displaying legitimacy, was the least observed theme (6 occurrences). By pointing out the potential benefits residents could gain from their participation, the document frames participation as a legitimacy-acquisition tool as this can be seen as a strategy to lure residents' support owing to the potential benefits that could emerge from the project. While literature points out nominal participation as a false display of legitimacy, indications of whether the framing of nominal participation in the Social Impact by Design policy was false was not identified during the thematic analysis.

The key findings of keywords presented below explains how the Social Impact by Design policy framed instrumental participation, nominal participation, representative participation and transformative participation, therefore providing further insights of this overview.

Key Findings

The overarching themes shown in Table 7 above are groups of keywords that were implicitly coded in Atlas TI. As a result, tables 8, 9, 10 and 11 show the distribution of keywords used under each theme, revealing the frequency of keywords utilised in framing each form of participation.

- **Instrumental participation (Table 8)**

Table 8: Frequency of codes related to instrumental participation

		PDF 2: social impact by design 42	Totals
◇ as a means of achieving projects' goals	9	4	4
◇ improving project's efficiency	10	8	8
◇ leveraging local resources	7	6	6
Totals		18	18

Keywords framing participation as a means to enhance project efficiency were the most frequently observed (8 occurrences), indicating that the policy places most emphasis on maximising output through the most effective manner. This is reflected in the document's framing of participation, which emphasis the need for team

collaboration to develop integrated solutions, suggesting the need to reduce redundant efforts and therefore save resources. The document states that *"to make BoTu the first resilient neighbourhood in Rotterdam, creative and integrated solutions are needed [...] search for integral and not partial solutions"* (p. 6). It further explains that *"during phase 2, the teams meet one or more times so that preliminary results are shared with each other. In this way, we ensure coherence between the proposals and promote collaboration between the teams"* (p. 10).

The ‘Social Impact by Design’ policy is an open call to residents and other stakeholders to contribute their resources. As such, participation as a way of leveraging local resources had 6 occurrences, indicating the strategic use of participants’ resources as the second most emphasised way to achieve projects’ goals. This is demonstrated by excerpts such as: *"This also requires that we actively look for new cooperation arrangements between citizens, government, and private companies to enable the necessary additional investments in BoTu"* (p. 5). *"Added value is created by bringing together talent and brainpower and applying innovative working methods. The combination of these elements forms the process within which we develop the package of investments for BoTu"* (p. 6). Such framing indicates the policy acknowledges that to attain projects’ goals, resources from residents too are required. This confirms to what literature explains about instrumental participation, where those leading the participation process see it as a means to achieve cost effectiveness since the participants are usually asked to bring in resources.

Keywords that explicitly framed participation as a means of achieving specific project goals had 4 occurrences out of the total 18 occurrences under this theme. Therefore, indicating that participants had to align with the predetermined objectives was the least emphasized. Nevertheless, it highlights that the tasks or initiatives carried out by the teams should align with existing goals. For instance, it states: *"All conceptual proposals submitted by the various teams are discussed in the Advisory Board. The aim of this is to determine to what extent the proposal contributes to achieving the overall goal of Resilient BoTu 2028"* (p. 9). This shows that the participation was geared towards achieving the overall projects’ pre-determined goals of the Resilient BoTu 2028 program.

- **Nominal participation (Table 9)**

Table 9: Frequency of codes related to nominal participation

		PDF 2: social impact by design 42	Totals
◇ access to potential benefits	3	2	2
◇ legitimacy	7	4	4
Totals		6	6

Texts pointing out participation as a legitimacy-acquisition tool had 4 occurrences, indicating that most emphasis was placed on the importance of abiding by regulatory requirements under this theme. It can be seen that such projects need to have the support of the residents, as the document explicitly states that *"Coordination is crucial to continue to guarantee local 'buy-in' from residents"* (p. 11). More emphasis on the importance of gaining residents' support is seen from the document as it states

that proposals can only be implemented if they have the backing of the residents. This is seen from the excerpt: *“An integrated and innovative solution is presented to the challenges formulated in the Resilient BoTu 2028 program. The proposal can count on support and enthusiasm from local residents”* (p. 11).

The document also has two instances where it depicts participation has a tool for pursuing potential benefits for the residents where it states that *“In the coming years, partners of the program will make every effort to remove these obstacles and create opportunities. Collaboration with companies in the Spanish Polder and M4H offers opportunities for the future. The energy transition also provides jobs for residents of BoTu”* (p. 13). This might encourage residents to support the project because they see it as a chance to gain benefits, and also validates why the energy transition is necessary. According to literature, in nominal participation, participants often view their involvement as an opportunity to achieve potential advantages therefore attracting their support. Nevertheless, although cases of false display of legitimacy were not explicitly identified during the thematic analysis of the document, explaining why it was nominal participation was the least emergent theme.

- **Representative participation (Table 10)**

Table 10: Frequency of codes related to representative participation

	PDF 2: social impact by design 42	Totals
◇ equal opportunity to voice opin... 12	5	5
◇ influence on direction and shap... 9	4	4
Totals	9	9

The ‘Social Impact by Design’ document almost equally emphasises two sub-themes of representative participation: allowing residents have the equal opportunity as other stakeholders to voice their opinions (5 occurrences), and to influence the direction or shape of the project (4 occurrences). This indicates that the policy maintains a nearly equal emphasis on valuing residents' opinions for both planning and shaping the direction of the energy transition. It states that *“Teams are helped in making contacts with residents and entrepreneurs in BoTu. The aim is to strengthen the plans of each team [...] The aim of phase 2 is further elaboration of ideas in close collaboration with local residents”* (p. 10). Additionally, an equal opportunity where residents are seen to have an equal chance to raise their concerns or ideas is shown wherein all parties are invited to participate by indicating that *“We work on the basis of equality. This means: in everything we do, we pay attention to others and listen to each other”* (p. 2).

- **Transformative participation (Table 11)**

Table 11: Frequency of codes related to transformative participation

		PDF 2: social impact by design 42	Totals
◇ capacity building through advisory	2	2	2
◇ capacity building through collaboration	7	3	3
◇ capacity building through training	2	1	1
◇ capacity through support	4	3	3
Totals		9	9

Under transformative participation, capacity building through collaboration and provision of support had the most instances (each with 3 occurrences). Capacity building through collaboration implies that participation is able to empower residents as they are able to make use of other participants' that they might not have had on their own. The document states that *"The challenges of BoTu are great. None of the parties individually is able to solve the problems structurally. It is crucial that broad cooperation with various partners is required"* (p. 5). This excerpt implies that neither of the parties has the capacity to single-handedly facilitate the energy transition. In this sense, residents' capacities to facilitate the energy efficiency within the neighbourhood can be improved by supporting them come up with solutions as opposed to solely relying on a single actor. The document states that *"Community building is aimed at further strengthening, connecting and mobilizing local communities. Neighbourhood development and renewal from within and bottom-up with a focus on capabilities instead of problems and shortcomings"* (p. 13). This aligns with literature's definition of transformative participation, where the participants are empowered to actively lead change by making decisions and act on their own.

Providing advisory as a capacity building effort had 2 occurrences. On both occurrences, the advice seems to be technical in nature, indicating that the residents had limited knowledge and/or capacity on energy transition. The document states that *"All conceptual proposals submitted by the various teams are discussed in the Advisory Board. The aim of this is to provide specific tips and points of attention for phase 2 for each team"* (p. 9) It further states that *"Each team is also supported with a financial specialist"* (p. 11). Such advisory is seen to empower residents prepare proposals that are feasible.

Training residents as a way of improving the capacity of residents was mentioned once in this document, indicating less emphasis on it. Nevertheless, this training appeared to enable residents who want to participate through work. The document states *"Residents of BoTu want to matter. If they work, voluntarily or paid, it is easier for them to participate in society. However, residents are having a hard time [...] Levers we provide are actively committed to training and guidance, buddy/peer support, and setting up a work cooperative"* (p. 13).

RQ. 2. How is resident participation framed in the Cooperation Agreement SOK BoTu?

a) Thematic Analysis Findings Overview

Table 12: Distribution of Resident Participation Themes in the Cooperation Agreement SOK BoTu Policy Document

		PDF 3: SOK-Botu_def 32	Totals
Instrumental Participation	4	29	11
Nominal participation	2	10	4
Representative Participation	2	21	12
Transformative Participation	4	15	6
Totals			33

Table 12 above shows that representative participation was the most recurrent theme (12 occurrences), although slightly above instrumental participation (11 occurrences). Based on this observation, it can be inferred that the ‘Cooperation Agreement SOK BoTu’ policy frames participation mainly as an opportunity where all participants have an equal opportunity to raise their voices and thus influence the direction of the project. Nevertheless, with instrumental participation following closely as second most observed theme, the policy also emphasises on having participation as a tool to achieve projects’ goals. Transformative participation emerging as the third most observed theme with 6 occurrences, indicates that empowering residents to be the main actors leading the energy transition was not the focus. This observation also explains why representation participation was the dominant theme, as literature highlights representative participation as a process where the decisions need to incorporate input from a diverse range of actors. Nominal participation was the least recurrent theme (4 occurrences), indicating that the policy had less focus on displaying legitimacy. The key findings below provide the keywords used to frame each form of participation in the policy document, thereby offering deeper insights and explanations.

Key Findings

Tables 13, 14, 15 and 16 shows the distribution of keywords used to group the respective themes of participation, and the frequency of keywords used to frame resident participation under each theme.

- **Instrumental participation (Table 13)**

Table 13: Frequency of codes related to instrumental participation

	PDF 3: SOK-Botu_def 32	Totals
◇ as a means of achieving projects... 9	5	5
◇ improving project's efficiency 10	2	2
◇ leveraging local resources 7	1	1
◇ tasks 3	3	3
Totals	11	11

The theme of instrumental participation in the ‘Cooperation Agreement SOK BoTu’ had mostly emphasised participation as a means of achieving projects’ goals (5 occurrences). This indicate the policy’s focus under this theme is the engagement of participants to assist accomplish the goals of the energy transition. Particularly, it calls on parties to commit to an agreement that binds and mandates them to establish goals and act towards accomplishing them. The document states that *“We discuss the agreements on the basis of the shared values and goals that we previously agreed on. [...] In the projects we show that we adhere to those values and goals. We show this by drawing up indicators”* (p. 3). On this sense, it can therefore be inferred that the focus of calling for participation is to act towards meeting the objectives of the energy transition, in which the parties are accountable.

Additionally, involving residents in a task-oriented manner had 3 occurrences, further explaining the emergence of instrumental participation in the document where residents have responsibilities. The document highlights that residents can support the energy transition by sharing information about energy saving amongst their neighbours. For instance, the document states that *“People can be trained as environmental/energy coaches. Together we will provide information about the energy transition and information about energy savings. This creates opportunities for work and training”* (p. 3). By highlighting that residents can be trained to act as environmental or energy coaches, their participation becomes a key means of achieving the intended goals, as they contribute by carrying out specific tasks.

Participation as a way of improving projects’ efficiency had two mentions. The document highlights that by integrating participation in the energy transition initiatives, there could be an opportunity to address broader community needs therefore improving the overall resilience of the neighbourhood. In that sense, participation is instrumentally framed as a tool to maximise the output, where other goals beyond those that are energy-related can be achieved. At the same time, it justifies why the energy transition is beneficial to the residents. For instance, it states that *“We work together on the transition to sustainable energy. We also look at the linking opportunities: the additional things that we can improve in the neighbourhood at the same time as the energy transition. Consider, for example, opportunities for education or work (neighbourhood development and community work), care, language, poverty (less debt), socializing and caring for each other”* (p. 2).

Although the least frequently mentioned (one occurrence), the policy frames participation as a way of leveraging local resources in which residents’ skills and talents are utilised. It explicitly states that “*We then discover what talents and skills there are in the neighbourhood, so that we can use them as best as possible*” (p. 3). This indicates that residents’ abilities can be recognised although it has been least emphasised in the document.

- **Nominal participation (Table 14)**

Table 14: Frequency of codes related to nominal participation

		PDF 3: SOK-Botu_def 32	Totals
◇ access to potential benefits	3	1	1
◇ legitimacy	7	3	3
Totals		4	4

Although nominal participation emerged as the least emerged theme in ‘Cooperation Agreement SOK BoTu’ document, the mentions of participation as a way of gaining legitimacy was the most dominant sub-theme (3 occurrences). Literature points out that the aim of nominal participation is the display of legitimacy, usually through false means where participants are lured by potential benefits to support a project. The sub-theme of the potential benefits residents could gain had only one occurrence in the document, indicating that luring residents was not the main focus under this theme. The benefit indicated is residents’ ease of access to other actors involved in the energy transition. It states that “*People who participate in projects are easily accessible to everyone: we share our names and numbers*” (p. 2). This excerpt illustrate tokenism, which is one of the attributes of nominal participation where participants are lured into participating. However, the document points out the need for genuine participation, as opposed to creating a sense of participation that displays false legitimacy, yet, it does mention that there may be limitation to transparency. It states that “*If possible, we discuss in advance what we will announce. We are open and transparent about the advantages and disadvantages and the costs and benefits of the various measures. This means that we are honest with each other, even if we cannot (yet) share something*” (p. 2).

- **Representative participation (Table 15)**

Table 15: Frequency of codes related to representative participation

		PDF 3: SOK-Botu_def 32	Totals
◇ equal opportunity to voice opini...	12	7	7
◇ influence on direction and shape...	9	5	5
Totals		12	12

Representative participation were participants have "equal opportunity to voice opinions," was the most mentioned (7 occurrences), indicating a priority on ensuring

that residents too have an equal chance as other stakeholders to share their ideas and opinions. The policy document states that “*Ideas and opinions from residents are just as important as those from organizations. Everyone’s contribution is part of the solution [...] All parties are given a suitable place at the table*” (p. 2). The mention of residents’ ideas and opinions having an influence on the direct and shaping of the project had five occurrences. An excerpt from the document states “*Residents have a say, ownership and can participate in a discussion*” (p. 2). These occurrences in the document reflect representative participation, where residents have equal power in influencing the direction of energy transition within the neighbourhood by inviting their ideas and opinions.

▪ **Transformative participation (Table 16)**

Table 16: Frequency of codes related to transformative participation

	PDF 3: SOK-Botu_def 32	Totals
◇ capacity building through advisory 2		0
◇ capacity building through collaboration 7	4	4
◇ capacity building through training 2	1	1
◇ capacity through support 4	1	1
Totals	6	6

Under transformative participation, the ‘Cooperation Agreement SOK BoTu’ document mostly emphasis participation as a tool for capacity building in the sense that parties can make use of each other resources through their collaboration emerged the most (4 occurrences). It states that “*Companies, organizations and residents’ initiatives, large or small, seek each other out. This way they can use each other’s network, talent and moments*” (p. 2). Other methods, such as "capacity building through training" and "capacity through support," had one mention each. This indicates while there may be intention to empower residents so that they are able to actively lead the energy transition, less emphasis is put on training and offering them support. Additionally, it reflects a priority in having participants, including residents, tap into their own capacities by way of collaborating with each other, therefore indicating a transformative form of participation where participation is intended to bring change through self-collective action and empowerment. The document states that “*We want to achieve this with the transition to sustainable energy in our neighbourhood: the energy transition. In that transition we can save energy together, or provide training*” (p. 1).

Summary of findings for research sub-question (1 and 2)

From the findings, it is seen that:

- Both policies frame participation as an instrumental tool for achieving efficiency and reaching project goals. The ‘*Social Impact by Design*’ policy focuses on using participation to streamline project outcomes, reduce redundancy, and leverage residents’ innovative ideas. The ‘*Cooperation Agreement SOK BoTu*’ also values residents’ skills and contributions, though it does so less prominently as compared to ‘*Social Impact by Design*’. It instead emphasizes the role of

residents in the energy transition, highlighting their roles such as environmental/energy coaches. Instrumental participation was the most dominant theme overall.

- Both policies frame participation as a way of gaining legitimacy to fulfil regulatory requirements for resident approval. The ‘Social Impact by Design’ policy stresses the importance of resident buy-in and uses potential benefits like job creation to validate the energy transition in BoTu. The ‘Cooperation Agreement SOK BoTu’ uses transparency to avoid nominal participation where false display of legitimacy can be pursued. Nominal participation was the least dominant theme in both policies.
- In both policies, representative participation emerged as they both encourage resident inputs to decision making. The ‘Social Impact by Design’ policy emphasizes collaboration, particularly in later project stages, to refine ideas with resident input. The ‘Cooperation Agreement SOK BoTu’ aims for an inclusive decision-making process, giving residents a significant role in shaping the transition.
- Both policies emphasis transformative participation, indicating that residents’ capacities are enhanced through collaboration with other actors. The ‘Cooperation Agreement SOK BoTu’ emphasizes strategic collaboration and mutual resource utilization to empower participants, focusing on collective action rather than extensive training. Similarly, the ‘Social Impact by Design’ policy also prefers collaborative methods but combines this with targeted financial support, showing less emphasis on training.

RQ. 3. What is the level of residents’ participation in the energy retrofitting of Gijsing Flats?

To find out whether the framing of resident participation in the ‘Social Impact by Design’ and ‘Cooperation Agreement SOK BoTu’ policies influenced residents’ levels of participation, the indicators of non-participation, tokenism, and citizen control, as outlined by Arnstein's ladder of participation were used. These findings helped point out residents’ degree of influence in the decision-making process of the energy retrofitting. Non-participation indicates little or no influence, tokenism indicates moderate influence, while citizen control indicates high influence. The findings were obtained from the following sources:

Data Source	Respondents	Role / Function
Questionnaires	31 respondents	Residents
Interviews	N ^o	
	R1	Representative from the Municipality
	R2	Resident
	R3	Resident
	R4	Resident
Focus Group Discussion	5 respondents	Residents

Findings -

1) Non-participation: To determine if residents were manipulated into endorsing predetermined decisions, the respondents were asked if the information they received appeared biased to guide them toward accepting the decisions. 77% of the respondents who filled in the questionnaire reported to have received sufficient information regarding the renovation of their housing units to allow them to air their concerns on the energy retrofitting process (table 17).

Table 17: Responses on whether residents received adequate information

Question	Responses	Frequency	Frequency (Percentage)
Was the information on the energy retrofitting process adequate?	Yes	24	77.42%
	No	7	22.58%

From one of the interviewees, it was stated that actors involved in the renovation process provided transparent and adequate information to residents. R1 stated that “...we had several ways, the social housing cooperation, they went door by door and they spoke with everyone. They informed them with a talk at everybody's home for one hour, and they had a booklet with all the information, what the people could expect and how the project would look and how it involved their home, For example, for how many days the constructor is in their home and that kind of stuff...”

Additionally, R4 also stated that “...we attended meetings where they informed us about the whole process. It was floor by floor. So residents living on this floor would gather and we were informed about the project, and it was the same for the other floors. In the meetings we also asked a lot of questions, which they answered...”

To find out whether non-participation occurred in the form of ‘therapy’, respondents were asked if there were attempts to change residents' attitudes or opinions rather than addressing their concerns. From the interviews, R3 stated that “...they would encourage us to share our concerns and also ask questions on matters where we needed verification. They provided more explanations which made me feel comfortable with the project...”. Additionally, 71% of the respondents in the questionnaire indicated there were no attempts to change their opinions regarding the renovation process (Table 18).

Table 18: Responses on whether there were attempts on changing residents' opinions

Question	Responses	Frequency	Frequency (Percentage)
Were there instances where your opinions regarding the renovation process were changed?	Yes	9	29.03%
	No	22	70.97%

Based on the above findings gathered, it can be inferred that residents' non-participation did not occur in the form of lacking to provide of adequate or non-transparent information, or attempts to change their opinions.

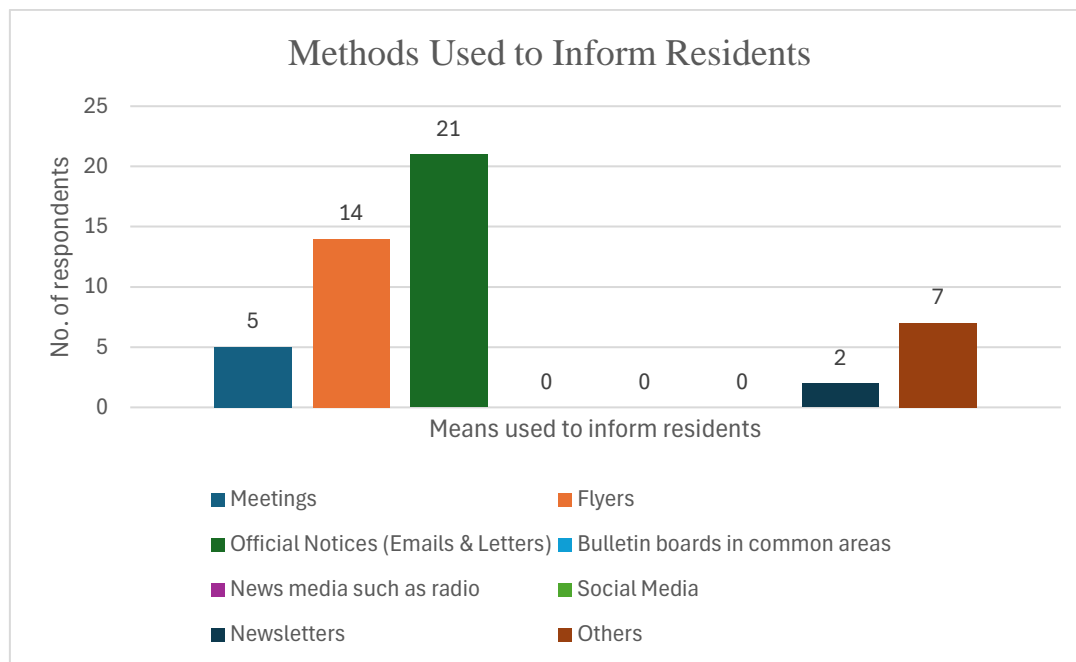
2) Tokenism: One-way communication with little or no avenues for residents' feedbacks or opinions served as an indicator for tokenistic kind of participation.

Therefore, respondents were asked if they received opportunities to respond or give feedback to the information they received regarding the renovation process. Almost 65% of the respondents who filled the questionnaire reported that their opinions were asked or had the opportunity to ask questions (Table 19).

Table 19: Responses on residents’ opportunities for Providing Feedback

Question	Responses	Frequency	Frequency (Percentage)
Were there opportunities to ask questions, negotiate or give feedback on the information you received about the renovation?	Yes	20	64.52%
	No	11	35.48%

Additionally, asking what methods of communication were used to inform residents assisted this study to assess whether residents really had the opportunity to provide feedback was possible. Data from the questionnaires indicate that the most common means of communication used to inform residents about the renovation methods was via official notices (emails and letters), followed by flyers and thirdly by other methods not included in the questionnaire.



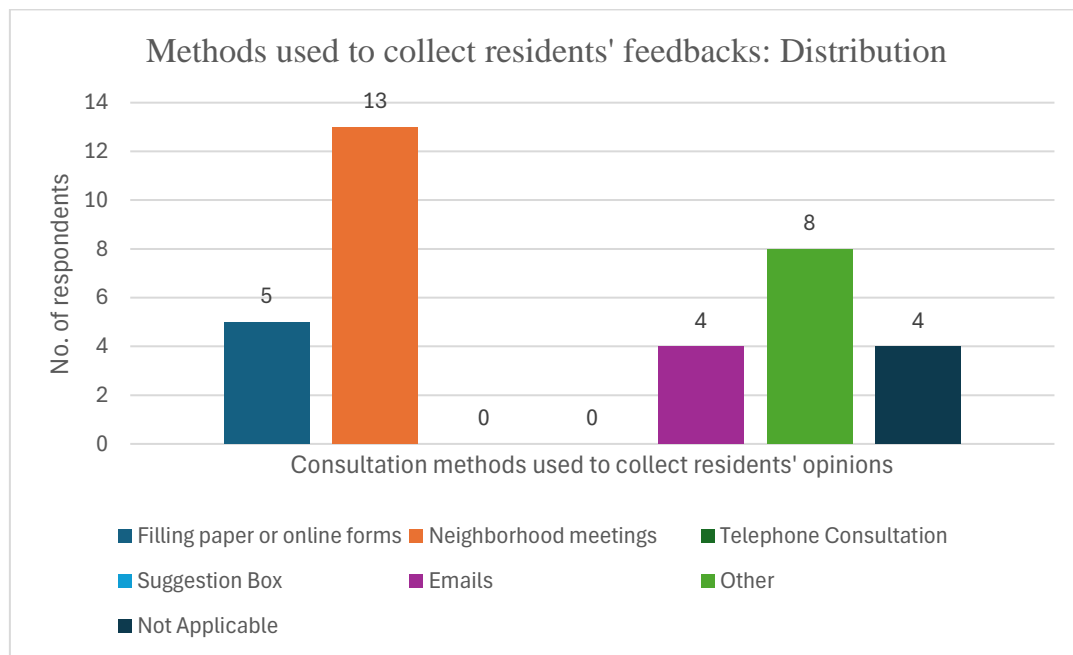
Graph 1: Distribution of methods used to inform residents

Interviews done during the field work captured other communication methods not captured in the survey. From the interviews, it was found that employing language and environmental coaches (mostly trained residents from the community) spread the word about the renovations plans and ongoing energy transition. Additionally, the Municipality of Rotterdam and the Havensteder housing association also provided information on the neighbourhood streets through word of mouth, and also invited residents to social activities which they could leverage to get information on the renovation. R1 stated that “...Despite the technical aspect, yeah, like putting all pipes in the ground and connecting to all the homes. There's also social side to the project, so we have several parties we work together with, and one of them is the Taal and

Milieu coaches. It's the language and environment coaches. Mostly women from the neighbourhood who we are working together with. And they can also give information in other language than Dutch. For example in Arabic or in Turkish, they can give information about the project to their neighbours..... we have several parties who are we working together with and one of them was the language and environmental coaches, but the other is the connection room or the diningskamer, You can look it up. But the municipality would go door by door and just invite people., Ok? Do you want to know your neighbours any better? And they would organise and invite them to any social activities..... So it was not only the one hour house by house, but we did several actions, actually we stood on the street, we knocked on the door another time and they could represent themselves... ”

While the data from the questionnaires show that meetings came in fourth as a way of informing residents about the renovation process, the meetings allowed residents to provide feedback as identified from the interviews. R2 stated that “...During the our neighbourhood meetings, we asked questions and also aired our concerns with the renovation process...”. R1 also substantiated that meetings allowed residents to provide the feedback “... We would organise another evening meeting so we tried to arrange that everybody would represent themselves ...”

The excerpts above and data from the questionnaire indicate that residents’ were consulted. The findings that other methods other than those listed on the questionnaires were useful in obtaining residents’ feedback coincide with answers to a question on what methods were used to acquire residents opinions. The category labelled ‘others’ was the second most selected option, because of the environmental and language coaches who were engaged to inform and consult residents’ feedbacks as highlighted above in one of the excerpts. Informing residents by word of mouth on the streets also explains why the category labelled others was the second most selected option, since the trained language and environment coaches were recruited from the neighbourhood, making it easy for them to understand each other. Meeting was the most common method used to consult residents’ opinions and concerns (Graph 2).



Graph 2: Distribution of the methods used to collect residents' feedbacks

Meeting was the most common method used to consult residents' opinions and concerns (Graph 2). These findings infer that informing residents were not tokenistic, because they were consulted through meetings or one on one interaction with the trained environmental and language coaches from the neighbourhood. Additionally, responses from the questionnaires, also revealed emails and forms were used to ask for residents' feedbacks.

Nevertheless, to find out if their consultation was tokenistic, respondents were asked if residents were engaged in other ways that would ensure their opinions were considered. Specifically, respondents were asked if residents participated directly or had representatives to represent them during decision making, a form of participation which Arnstein refers to as placation. Majority of the respondents (74.19%) indicated in the questionnaire that residents had representatives or neighbourhood teams to represent them in platforms or sessions where decisions were made (Table 20). From the focus group discussion, it was also identified that there were neighbourhood teams who forwarded residents' interest during decision making “...there are various parties working with the residents in helping them transition to energy efficiency. Some of them are the local energy cooperatives, who work in close collaboration with the municipality and the housing association. They present residents' needs to the municipality for consideration when making plans about heat transition. There are also various local non-governmental organizations within the neighbourhood who come up with initiatives such as solar energy...”

Table 20: Responses on whether residents' interests were represented in decision making platforms

Question	Responses	Frequency	Frequency (Percentage)
Were residents directly involved or had representatives to present their interests and opinions when making decisions on the renovation?	Yes	23	74.19%
	No	8	25.81%

3) Citizen control: To confirm that ‘placation’ (having residents’ representatives or teams in sessions where decisions were made) was tokenistic or not, an enquiry into the indicators of ‘citizen control’ was made. Residents were therefore asked whether the residents or their representatives had an influence on the decisions made on energy retrofitting process. Specifically, they were asked whether they had an influence on the choice of renovation measures and the design/appearance of the renovations, as these factors influence energy efficiency, according to literature provided. A majority of the respondents (61.29%) indicated in the questionnaires that neither the residents nor their representatives had an influence on the choice of renovation measures or on the design and appearance of the renovations (Table 21). However, a few of the respondents indicated that the residents’ representatives had an influence on other aspects, indicating that placation with regards to energy efficiency measures was tokenistic.

Table 21: Aspects influenced by the residents or representatives

Question	Responses	Frequency	Frequency (Percentage)
Did residents (or their representatives) achieve in influencing the following?	Choice of renovation measures	2	6.45%
	Design & appearance of the renovations	3	9.68%
	None of the above	19	61.29%
	Other	7	22.58%

Findings from the interviews and focus group discussion also substantiate limited influence on the choice of renovation measures or their design. One of the interviewees indicate that plans on the technical management of renovation process were made beforehand to align with existing initiatives within the neighbourhood. R1 stated that “...we only inform them because it goes along with the sewer renewal. And that's like the main leading aspect why we started also in this neighbourhood, we could combine the works for the district heating, we could combine it with the renewal of the sewer system, which also had to happen here in the neighbourhood. So that was fixed, the time schedule was sort of fixed so they couldn't negotiate on that...”.

The above excerpt indicates that the reason the energy transition plans begun in Bospolder-Tussendijken was to align with other ongoing initiatives such as the sewer renewal, therefore indicating that the residents had limited influence on the technical aspects. An excerpt from an archival record (a video recording transcript of a discussion around BoTu becoming a natural-gas free neighbourhood) gives a similar indication. It states that:

“...under that we are below this district level, the more individual level of the household plays a role and you actually have to take that into account... Yes, people who are becoming more assertive. They come up with all kinds of initiatives, including all kinds of solutions. How do you make that a place?..... Yes I think mainly connecting to that, see what's going on in the neighbourhood we just talked about, and take your chances. But consider what the role of the municipality is, so if that is a strongly hierarchical role, then yes, it is very difficult to really give all those initiatives from the neighbourhood a place. ...”

Information collected during the interviews indicate that residents did not have an autonomous decision-making power over the choice of energy efficient measures. R1 stated that “... they had opportunities to participate and if they want to start some small project also from the energy systems or like do small adjustments in homes to lower their energy, we supplied the material and goods..... Did they have the freedom to choose what type of materials they required? No, no, they were like quite standard actually, yeah. So they would be supplied by the language and environmental coaches and they ordered them...”. One of the respondents from the focus group discussion also stated that “...for the residents renting from the housing association, the renovation designs and materials were mostly decided by energy company and housing association. Although during renovation, a few residents gave

suggestions on the renovation designs, but most of the time it was decided by the housing association...”

The above excerpts are also an indication that residents did not have the final decision-making power, nor did they have autonomous or independent decision-making ability, over the choice of energy efficiency measures.

Summary of findings for research sub-question (3)

While both policies made efforts to include residents through various forms of participation, the overall impact on decision-making was limited. Findings indicate that residents’ participation was mainly tokenistic, as they had opportunities to provide feedback or opinions although with limited control over technical aspects of the energy retrofitting process. Nevertheless, non-participation was not reported as majority of the respondents indicated to have received adequate information, hence it can be inferred that manipulation did not occur. Most of the respondents also reported not to have experienced any attempts of having their opinions changed. The findings indicate that residents did not have full control, neither they have delegated power over the technical aspects of the renovation process.

RQ. 4. What are the energy efficiency outcomes of the renovated housing units of Gijsing Flats?

To find out whether there was improved energy efficiency of the renovated buildings, respondents were asked if there was a reduction in the cost of energy utility bills after the renovation. They were also asked about the energy certification label the housing units received after the renovation. Majority of the respondents (77.42%) reported in the questionnaires not to have experienced a drop in the cost of energy utility bills after the renovations, while a few (22.58%) indicating to have experienced a slight decrease (Table 22).

Table 22: responses on energy cost reduction

Question	Responses	Frequency	Frequency (Percentage)
Have the cost of energy bills decreased since the renovation was completed?	Did not decrease	24	77.42%
	Slight decrease	7	22.58%
	Moderate decrease	0	-
	Significant decrease	0	-

Similar observations where the energy utility cost did not reduce were also pointed out during the interviews. R1 stated that “...*Actually, the prices went up, rose quite a lot, so also the prices of the district heating. Due to what happened in 2020, the energy crisis. So there was some unexpected cost, which we couldn’t control it. Yeah. Yeah. So beforehand we would, we thought, and we also presented it as any cost reduction in the monthly cost, but afterwards it was different story actually...*”. One of the respondents from the focus group discussion also stated that “...*Although the house feels more warm than before, I have not experienced a decrease in the energy cost since my home was renovated. The insulation and the water heating is good, but the cost of energy has not reduced...*”

Despite the lack of a significant reduction in energy utility bills, it is noteworthy that the renovated buildings achieved high energy efficiency standards. From the focus group discussion, it was noted that more homes got an energy label of A: “... *We did manage to get more homes up to an A energy label, which was a significant achievement. The renovations also made the homes better with insulation...*”.

Summary of findings for research sub-question (4)

While the renovations successfully improved the energy efficiency of the housing units, as evidenced by higher energy certification labels and better insulation, the expected reduction in energy utility bills was not achieved.

4.3 Analysis and Discussion

To understand the relationship between policy discourse (framing of resident participation), the level of resident participation (actual degree of influence), and the resulting energy efficiency outcomes, the analytical framework (Table 3) developed from literature review in chapter 2 was used. Table (23) shows the analysis of the findings.

Table 23: Analysis of the findings

Framing of resident participation	Level of resident participation (+/-)		Energy efficiency outcomes	
	Variable 1	Variable 2	Variable 3	
			Compliance with energy regulations	Cost of energy utility bills
Nominal	manipulation	(-)	High	Low
	therapy	(-)		
Instrumental	Tokenistic informing	(-)		
	Tokenistic consultation	(+)		
	Tokenistic placation	(+)		
Representative	Partnership	(-)		
Transformative	Delegated power	(-)		
	Citizen Control	(-)		
Legend:				
<ul style="list-style-type: none"> ▪ (+) most observed ▪ (-) least observed 				

Discourses employed in the framing of resident participation reflected all Sarah White’s (1996) forms of participation although at varying degrees of emphasis, resulting in different outcomes with regards to how they influenced residents’ participation the renovation process. The thematic analysis of both policy documents revealed that the framing of resident participation as nominal was the least dominant discourse, explaining why manipulation and therapy level of resident participation were not observed. Additionally, language acts as a form of social power in its role

to shape decision-making processes during transitions, since various stakeholders employ a variety of discourses during transitions processes that result in various outcomes (Escobar, 1998; Rocheleau et. al, 2013). Power can be indirectly expressed, through the language employed to persuade others to adopt a stance or to form discursive alliances (Birkenholtz, 2009). This also explains why Arnstein's (1969) manipulation (convincing residents to take already pre-determined decisions) and therapy (changing residents' opinions or ideas) were least reported, as residents are regarded as active participants and not as passive recipients of top-down decisions in both policies. In addition, the 'Cooperation Agreement SoK BoTu' emphasized transparency in decision making to build trust among residents and other stakeholders. Such framing where transparency is emphasized further explains why manipulation and therapy were least reported.

Local intermediaries bridge the gap between niche-level initiatives and broader regime changes, playing a crucial role in transforming the energy sector and fostering trust among stakeholders (Laborgne, 2023). This is evident in the case study presented in this research, where the environmental coaches recruited from the neighbourhood help residents adopt energy efficiency measures, thereby acting as intermediary actors between the residents and other stakeholders. This observation is supported by a similar finding by Wilde & Spaargaren (2019), who states that in low carbon retrofit housing projects, strategic intermediary actors positioned between supply-side actors and end-users can establish trust among residents.

While the framing of participation as instrumental was dominant, instances of tokenistic efforts to merely inform residents were least recorded. Most residents reported having the opportunity to contribute their input, despite the instrumental framing of participation that focused in achieving efficiency. This observation is consistent with Hendriks' (2009) argument that incorporating diverse knowledge and participants fosters innovation, as opposed to merely depending on expert knowledge. Following Hendriks' argument, residents' inputs were therefore viewed as a valuable resource for driving efficiency in the energy transition. This also explains why tokenistic informing was least reported. Nevertheless, instances of tokenistic consultation were mostly reported. The thematic analysis of the 'Social Impact by Design' policy revealed a focus on the need for innovative ideas to drive the energy transition, therefore implicitly excluding ideas that are not deemed innovative. This means that when residents are invited to contribute to a context where their input is valued mainly for its resource potential, their participation can become tokenistic. This is if they lack the education or experience to generate the innovative ideas that are sought. This creates a power imbalance, which also explains why tokenistic placation was observed. Residents or their representatives were outpowered in decision-making as they may have lacked sufficient knowledge about energy efficiency measures. Additionally, it also explains why partnerships was least reported, as the power imbalance suggests that residents or their representatives did not have an equal level of influence as other stakeholders on matters regarding the choice of energy efficiency measures implemented. The presence of tokenistic placation, along with the absence of partnership, delegated power, and citizen control, suggests that instrumental participation took precedence over representative and transformative participation. Neither representative nor transformative participation resulted in residents participation through partnership, having delegated power or exercising control over the renovation process.

To discuss how the residents' level of participation (or degree of influence) relates to the energy efficiency outcomes, this research employs the multi-level perspective (MLP) framework. Wilkinson et al., (2021) highlights the importance of examining various levels of influence using the MLP framework to understand significant shifts in socio-technical systems, highlighting the importance of examining various levels of influence. Based on the analytical framework (Table 23), tokenistic consultation and placation were the most frequently reported forms of participation, whereas other levels were less common. Nonetheless, a significant impact was observed in ensuring that the retrofitted buildings complied with energy regulations and attained the highest energy certification labels. Based on this observation, it can be inferred that although residents' housing units achieved a high energy certification label as required by the EPBD and Dutch LTRS, residents had minimal influence since tokenism was observed in their placation and in how they were consulted. Geels (2011) refers to such forces as landscape pressures, which exert pressure on the regime. This also explains why despite achieving energy efficiency as indicated by the high energy labels, the cost of energy utility bills did not drop. From the findings it was noted that reduction in energy utility cost was not achieved due to energy crisis. Such landscape pressures are external influences beyond the control of the regime (i.e. actors and their associated practices and norms/rules).

5. Conclusions

The aim of this study was to investigate how the framing of resident participation in policies (the independent variable) affects the actual level of resident participation (the mediating variable) and, in turn, the resulting energy efficiency outcomes (the dependent variable). Using the renovation of the Gijsing flats in Bospolder-Tussendijken, a neighbourhood with a low social index⁶, as a case study, the research sought to address the gap identified by Breukers et al. (2017). They noted a lack of understanding regarding how external initiatives can effectively stimulate local engagement in deprived neighbourhoods where grassroots initiatives are often weak or missing. This study examined how the way resident participation was framed in the ‘Social Impact by Design’ and the ‘Cooperation Agreement SOK BoTu’ influenced both the level of resident involvement and in turn the energy efficiency outcomes achieved.

5.1 Summary of Findings

SRQ 1 and 2: How is resident participation framed in the ‘Social Impact by Design’ and ‘Cooperation Agreement SOK BoTu’ policies?

The thematic analysis of the policy documents proved suitable for uncovering the ways in which resident participation was framed. The analysis revealed that both ‘Cooperation agreement SOK BoTu’ and ‘Social Impact by Design’ policies framed resident participation across all four forms identified by Sarah White (1996): nominal, instrumental, representative, and transformative. However, the emphasis varied, with instrumental participation being the most recurrent theme, followed by representative participation, then transformative participation, and lastly nominal participation (least recurrent).

In both policies participation is framed as an instrumental tool for achieving efficiency and reaching goals. The ‘*Social Impact by Design*’ policy focuses on using participation to streamline project outcomes, reduce redundancy, and leverage residents' innovative ideas. The ‘*Cooperation Agreement SOK BoTu*’ also values residents' skills and contributions, though it does so less prominently. It emphasizes the role of residents in the energy transition, highlighting their responsibilities and the broader goals like job creation..

Both policies frame participation as a way of gaining legitimacy to fulfil regulatory requirements for resident approval. The ‘Social Impact by Design’ policy stresses the importance of resident buy-in and uses potential benefits like job creation to validate the energy transition in BoTu. The ‘Cooperation Agreement SOK BoTu’ uses transparency to avoid nominal participation where false display of legitimacy can be pursued.

The Cooperation agreement SOK BoTu’ and ‘Social Impact by Design’ encourage resident input through representative participation. The ‘Social Impact by Design’ policy emphasizes collaboration, particularly in later project stages, to refine ideas with resident input. The ‘Cooperation Agreement SOK BoTu’ aims for an inclusive decision-making process, giving residents a significant role in shaping the transition. Additionally, both policies emphasis transformative participation where residents’ capacities are enhanced through collaboration with other actors. The ‘Cooperation Agreement SOK BoTu’ emphasizes strategic collaboration and mutual resource utilization to empower participants, focusing on collective action rather than extensive training. Similarly, the ‘Social Impact by Design’ policy also prefers

⁶The social index is a measure indicating how neighbourhoods perform in terms of residents’ perception on quality of life. They are divided into 4 categories (capacities, participation, connectedness and living environment). Capacities include education level, income, health and debt. Participation entails residents’ social contact while connectedness refers to residents’ commitment and engagement in the district. The living environment refers to suitable housing (Gemeente Rotterdam, 2019).

collaborative methods but combines this with targeted financial support, showing less emphasis on training.

SRQ 3: What is the level of residents' participation in the energy retrofitting of Gijssing Flats?

Findings indicate that residents' participation was mainly tokenistic, as they had opportunities to provide feedback or opinions although with limited control over technical aspects of the energy retrofitting process. Nevertheless, non-participation was not reported as majority of the respondents indicated to have received adequate information. Most of the respondents also reported not to have experienced any attempts of having their opinions changed. The findings indicate that residents did not have exercise full control, neither did they have delegated power over the technical aspects of the renovation process. Additionally, partnership in the sense that residents had equal power or influence over the decisions made was not reported.

SRQ 4: What are the energy efficiency outcomes of the renovated housing units of Gijssing Flats?

The energy retrofitting project achieved compliance with energy regulations, which mandates that buildings have a minimum energy label E by 2030. All the renovated housing units met this requirement, with most of them having either an energy certification label of A. Nonetheless, the findings also indicate that energy cost reduction was not achieved in all the renovated buildings, as most respondents reported that they did not realize a decrease in the cost of their energy utility bills.

MRQ: How do policies guiding the renovation of the Gijssing flats frame resident participation and thereby influence resident participation in the decision-making processes to achieve energy cost reduction and regulatory compliance?

Reflecting on the conceptual and analytical framework of this study, it can be concluded that nominal participation did not lead to residents being subjected to non-participation through manipulation or therapy. This observation could be explained by the emphasis on transparency in aiming to gain residents' support and legitimacy. Nevertheless, the instrumental framing of participation led to the observed tokenistic consultation and placation of residents. This could be explained by dominant framing of participation as instrumental in both policies, as residents' inputs had to be considered only if they contributed towards achieving the projects' goals. This further explains why higher levels of residents' participation, that is, partnership, delegated power or exercise of control over the renovation process were not observed despite the framing of participation as representative and transformative in both policies. The representative framing aimed to ensure that residents had equal opportunities to voice their opinions and influence project decisions, while the transformative approach emphasized capacity building and empowering residents to actively contribute to and lead the energy transition efforts. Based on this, it can be concluded that the representative and transformative framing of participation in policies does not lead to higher levels of participation if there is power imbalance between the participants and those leading or initiating the participation process.

Additionally, by situating the case study analysed within the context of socio-technical transitions, the study aimed to explain how residents' level of participation influenced the two energy efficiency outcomes (i.e. energy utility cost and regulatory compliance). While high energy certification labels indicate successful compliance with energy regulations, this outcome was achieved with minimal resident influence due to the tokenistic nature of their participation. On that note, it can therefore be concluded that when resident participation is limited to tokenistic consultation and placation, regulatory obligations can still be met if those in power are determined to do so. Additionally, this study establishes that tokenistic levels of participation did not result in a decrease in energy utility prices.

5.2 Recommendations

Policies focusing on leveraging participants' inputs to advance goals set by those leading or initiating the participation process should place an equal emphasis on improving the capacity of participants as well as the voice to determine the direction of the project. This may address power imbalances between participants and decision-makers to foster more meaningful participation.

5.3 Future Research

The findings of this research highlight potential gaps that future studies could address. Notably, since this research found that representative and transformative framings of participation do not result in higher levels of participation when there is a power imbalance between participants and decision-makers, future research could investigate whether enhancing participants' capacities lead to more meaningful and higher levels of participation. Additionally, future research could investigate whether these higher levels of participation (partnership, delegated power, and citizen control) in energy retrofitting projects lead to a reduction in energy utility costs. Such a research would be valuable especially for contexts similar to Bospolder-Tussendijken where there is need for affordable energy.

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Appendix 1: Structured Questionnaire

The purpose of this survey is to collect your feedback about your participation or involvement in the renovation of Gijsing residential apartments in BoTu. These valuable insights will significantly support scientific research. The information provided will be used for academic purposes only. Your participation and the information collected during the study will be treated in the strictest confidence. The research complies with the Personal Data Protection Act/university policy. No information is reported that could uniquely identify you. By completing this form, you agree that your participation is voluntary.

1. How did you find out about the renovation of Gijsing Flats?

- Meetings Flyers Official Notices e.g. emails/letters News media
 Social Media Text messaging Newsletter Newsletter
 Bulletin boards/posters on common areas such as entrance/elevator Others

2. Was the information on the energy retrofitting process adequate?

- Yes No

3. Have you had the opportunity to ask questions, negotiate or give feedback on the information you received about the renovation?

- Yes No

4. Have you been asked for your opinion on the renovation of the housing units?

- Yes No

5. If answered yes to question 4, how was your opinion asked about the renovation of the living spaces?

- Meetings Flyers Official Notices e.g. emails/letters News media
 Social Media Text messaging Newsletter
 Bulletin boards/posters on common areas such as entrance/elevator Others

6. Were there instances where your opinions regarding the renovation process were changed?

- Yes No

7. Were residents directly involved or had representatives to present their interests and opinions when making decisions on the renovation?

- Yes No

8. In answered yes to question 7, did residents (or their representatives) achieve in influencing the following:

- Choice of renovation measures such as insulation, window upgrades, or efficient heating and cooling systems
 Design and appearance of the renovations
 None of the above
 Other

9. Have the cost of energy bills decreased since the renovation was completed?

- Did not decrease Slight decrease Moderate decrease Significant decrease

10. What energy certification label did your home achieve after the renovation was completed?

- A B C D E F G

Appendix 2: Semi-structured Interview Guide for Residents

Introduction Part:

My name is Eric Lennox and I'm a student at the Institute of Housing and Urban Development Studies, taking a Master of Science in Urban Management and Development. I am currently doing a research study to understand how policies can influence resident participation in the energy retrofitting of buildings. The purpose of conducting this interview is to collect data on how residents of Gijsing flats participated in the renovation of their housing units. I prepared both open and closed ended questions. With your permission, I request to have not more than 20 minutes of your time to conduct this interview. I'm also requesting for your consent to record this interview. Any information you give during the interview will be kept private and anonymous, and therefore your name will not be recorded. With your consent and permission, may we proceed with the interview?

Background Question

Were you a resident of the Gijsing Flats before and during the renovation?

Yes No

Interview Questions

1. How did you first learn about the plans to renovate the housing units?

2. Did you share your concerns or feedback about the renovation process?

Yes No

Follow-up question:

Do you think your concerns or feedback were addressed or were there attempts to change your opinions?

3. Do you think the information received about the renovation plans was adequate?

.....

4. Were residents' opinions or ideas asked on how to go about the renovation process?

Yes No

Follow-up question:

How were these opinions asked or consulted?

5. How did you (or other residents) ensure that their interest were presented during decision making?

.....

6. Did you (or other residents) participate in the decision making or have representatives to present their interest during decision making?

Yes No

Follow-up question:

Do you think the decisions were made jointly between the residents and other stakeholders involved?

.....

7. Were there instances when you (or other residents) have full decision making authority over the renovation process?

Yes No

Follow-up question:

If so, over which aspects of the renovation process did you (or other residents) have the full decision making authority?

8. Did you experience a reduction in the cost of energy utility bills after the renovation?

Yes No

9. What is the energy certification label did your home receive after the renovation was completed?

A B C D E F G

Appendix 3: Semi-structured Interview Guide for the Municipality

Introduction Part:

My name is Eric Lennox and I'm a student at the Institute of Housing and Urban Development Studies, taking a Master of Science in Urban Management and Development. I am currently doing a research study to understand how policies can influence resident participation in the energy transition. The purpose of conducting this interview is to collect data on how residents of Gijsing flats participated in the renovation of their housing units, which was part of the energy transition taking place in Bospolder-Tussendijken under the Resilient BoTu 2028 program. I prepared both open and closed ended questions. With your permission, I request to have not more than 20 minutes of your time to conduct this interview. I'm also requesting for your consent to record this interview. Any information you give during the interview will be kept private and anonymous, and therefore your name will not be recorded. With you consent and permission, may we proceed with the interview?

Opening Question

How would you briefly describe the energy transition in Bospolder-Tussendijken district?.....

Interview Questions

1. How were residents informed about the plans on the energy transition?
2. Do you think the information provided to the residents about renovation plans was adequate?.....
3. Did the residents have the opportunity to give feedback or opinions?

Yes No

Follow-up question:

If yes, what mechanisms did the residents use to provide their feedback or opinions?

.....

4. Why was it necessary to involve the residents?.....
5. Were there any ways that residents supported the project, for instance by contributing their resources such as skills, ideas or knowledge?

6. Did residents have an influence on the technical approach or management of the project?

Yes No

Follow-up question:

If yes, how did the residents influence the technical approach or management of the project?.....

7. Did residents have the autonomy to choose the type of energy-efficiency materials or measures?

Yes No

Follow-up question:

If yes, how did the residents go about on their choice of energy-efficient materials or measures?.....

8. Did residents have representatives to present their interest in decision-making boards?

Yes No

Follow-up question:

If yes, who were these representatives and how did they present the residents' interest?

9. Have residents reported a reduction in energy costs or savings after the renovation?

Yes No

Closing Question

Thanks for your contribution in my research. Would you like to add anything that may be important for my study?

Appendix 4: Focus Group Discussion Guide

Introduction

Welcome everyone. I'm Eric Lennox, and I will be facilitating today's discussion. Thank you all for joining. We're here to discuss and hear your views about how the residents of Bospolder-Tussendijken, particularly those living in Gijsing Flats, participated in the energy retrofitting of their housing units. Your opinions and experiences are really important, and there are no right or wrong answers. I want to encourage an open, respectful conversation. Please allow others to finish speaking before sharing your thoughts. We want to hear from everyone, so I might ask for input from participants who may be quiet. This discussion is confidential. Your names or anything that will aid in showing your identity will not won't be linked to any specific comments in the final report of this research. I am also requesting that I may record this discussion for accuracy. We will be recording this session for accuracy. Is everyone comfortable with that?

Questions

1. How long have you been living in Gijsing flats?
2. How were you informed or get the information about the plans to renovate the housing units?
3. What were your initial thoughts when you first heard about plans to renovate the housing units?
4. Do you think the information received about the renovation were adequate and transparent?
5. Did the housing association, or the municipality or other parties involved reach out to seek your opinions or concerns?
6. Did you inform the housing association, or the municipality or other parties involved about your thoughts or opinions on the plans to renovate your homes?
7. How did the residents support the renovation process? Were the some kind of tasks or responsibilities the residents had in formulating and implementing the process?
8. How were residents' interests presented during the decision making process?
9. Did residents have any decision making authority or autonomy in the technical approach of the renovation, for example the energy-efficiency measures?
10. Have you experienced a reduction in energy cost after the renovation were completed?

Closing

Before we wrap up, I'd like to quickly summarize some of the key points we've discussed today: ".....".


Does anyone have any final comments or thoughts that we haven't covered yet? ".....".

We'll be reviewing the discussion and using it for our research on resident participation in the renovation of Gijsing flats. If you have any further questions or thoughts, feel free to reach out on my contact. Thank you all for sharing your insights today. Your contributions have been really valuable.

Appendix 5: Scoring scale for the comparative analysis of energy efficiency outcomes

Score	High	Moderate	Low to Moderate	Low
Energy compliance				
Energy certification label	A (A+, A++) , B	C, D	E, F	G
Energy cost reduction				
Reduction in the energy utility cost	Significant decrease	Moderate decrease	Slight decrease	Did not decrease

Appendix 6: Codebook 1 (Thematic Analysis)

Code Manager		Code-Document Analysis														
Search Codes			Search Code Groups					PDF 2: social imp... 42		PDF 3: SOK-Botu... 32		Totals				
✓	Name	Grounded	✓	Name	Size											
✓	◊ access to potential bene...	3	✓	◊ Instrumental Participation	4	◊ access to potential benefits	3	2	1	3						
✓	◊ as a means of achieving...	9	✓	◊ Nominal participation	2	◊ as a means of achieving projects' goals	9	4	5	9						
✓	◊ capacity building throug...	2	✓	◊ Representative Participation	2	◊ capacity building through advisory	2	2		2						
✓	◊ capacity building throug...	7	✓	◊ Transformative Participation	4	◊ capacity building through collaboration	7	3	4	7						
✓	◊ capacity building throug...	2				◊ capacity building through training	2	1	1	2						
✓	◊ capacity through support	4				◊ capacity through support	4	3	1	4						
✓	◊ equal opportunity to voi...	12				◊ equal opportunity to voice opinions	12	5	7	12						
✓	◊ improving project's effic...	10				◊ improving project's efficiency	10	8	2	10						
✓	◊ influence on direction a...	9				◊ influence on direction and shape of the pr...	9	4	5	9						
✓	◊ legitimacy	7				◊ legitimacy	7	4	3	7						
✓	◊ leveraging local resources	7				◊ leveraging local resources	7	6	1	7						
✓	◊ tasks	3				◊ tasks	3		3	3						
Search Documents			 <p>No document groups</p>			◊ Instrumental Participation	4	29	18	11	29					
✓	ID ^	Name				Quota...	◊ Nominal participation	2	10	6	4	10				
✓	D 2	social impact by design				42	◊ Representative Participation	2	21	9	12	21				
✓	D 3	SOK-Botu_def				32	◊ Transformative Participation	4	15	9	6	15				
						Totals			84	66	150					

Appendix 7: IHS copyright form

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3. The thesis should be edited.

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