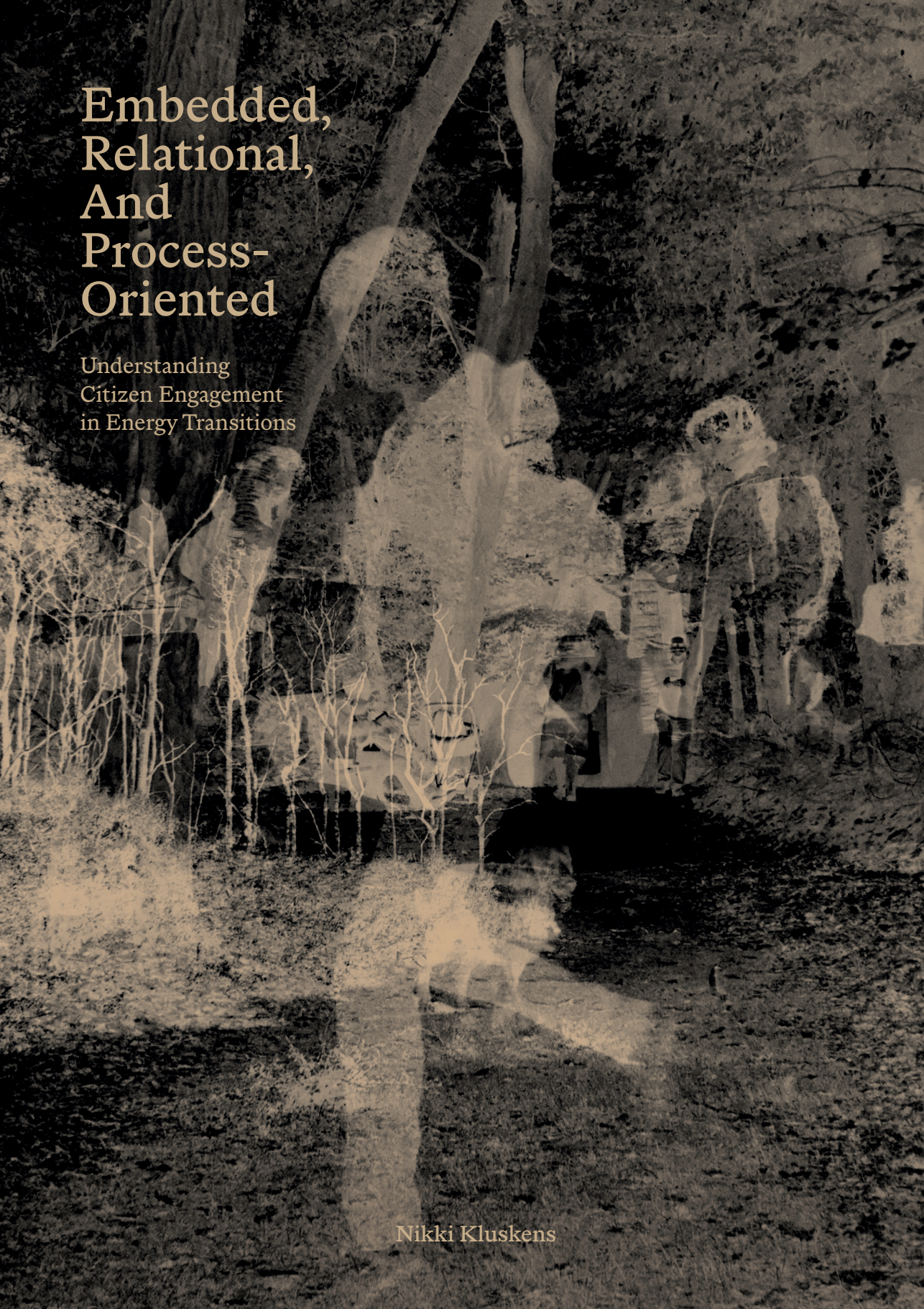

Embedded, Relational, And Process-Oriented

Understanding Citizen Engagement in Energy Transitions

Nikki Kluskens

Embedded, relational, and process-oriented: Understanding citizen engagement in energy transitions

Dit proefschrift is goedgekeurd door de promotoren en de samenstelling van de promotiecommissie is als volgt:

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Embedded, relational, and process-oriented: Understanding citizen engagement in energy transitions

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Technische Universiteit Eindhoven,
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The photographs in this dissertation were taken by Luka Kluskens and serve as a visual counterpart to the written chapters. Each image corresponds to a theme and reflects my need not only to write, but also to visualize what I mean, precisely because words sometimes fall short.

The cover images and chapter photographs depict people in relation to their surroundings. Wind and warmth, two contexts of energy transitions, form the common thread. The longer one looks, the more layers emerge: people embedded in their environment, interwoven with everyday reality. This embeddedness is, to me, essential, because energy transitions cannot be separated from daily life. Everything is interconnected, and while in our relationships we deeply long for connectedness, we sometimes push it aside when trying to manage the complexity of transitions.

The photographs invite us to look beyond first impressions, to question assumptions, and to reconsider reality again and again. Perhaps nothing is quite what it seems at first glance. In that sense, the images are not merely illustrative, but also an invitation: to embrace complexity and to recognize that being human means being embedded in a world that is constantly in motion.

Contents

Summary
Citizen engagement is increasingly acknowledged as a cornerstone of successful energy transitions. Despite this widespread acknowledgement, dominant framings of citizen engagement remain narrow and strongly outcome-oriented. In both policy and academic contexts, engagement is frequently approached as something to be "checked off" or "carried out", a procedural step in the transition process. Citizen engagement is thereby frequently conceptualized against the backdrop of what engagement is expected or supposed to achieve: for example smoother implementation, increased fairness and legitimacy, or the empowerment of citizens.

Such outcome-oriented framings reduce engagement to a tool or aspirational goal, overlooking the complex and situated realities of citizen involvement. Crucially, they implicitly position citizens as external to the system, "them", rather than as embedded actors whose roles, perspectives and agency are shaped by institutional, socio-technical, and relational contexts. When engagement is narrowly framed, (calls for) participation risk(s) becoming superficial, a mere checkbox exercise that fails to address deeper dynamics shaping citizen involvement. As such, narrow framings of citizen engagement remain ill-equipped to deliver on their promises, whether of acceptance, fairness, or democratic legitimacy, without a richer understanding of citizen engagement in practice.

This dissertation responds to this by examining citizen engagement trough a combined analytical lens that foregrounds embeddedness, relationality, and process. It engages critically with three reoccurring concepts that foreground citizen engagement in energy transitions, yet often do so in reductive ways: community acceptance, energy citizenship, and local heat transition coordination in marginalized settings. The overarching question addressed is: *How can citizen engagement be understood comprehensively, and what implications does this have for citizen engagement in energy transitions?*

Empirically, this research investigates engagement across heat, wind and solar energy transition contexts in the Netherlands. It draws on qualitative data from fifty-three stakeholders, including residents, across eleven case studies, covering a range of geographical contexts in the Netherlands: from rural to urban areas, and from marginalized to more affluent neighborhoods.

Chapter 2 revisits community acceptance, addressing the persistent gap in understanding how engagement contributes to outcomes such as acceptance. Existing studies often conceptualize community acceptance as a static outcome rather than a dynamic process. This chapter reconceptualizes community acceptance as a dynamic process that emerges through interactions among multiple actors, each with different roles and perceptions towards various aspects of energy tran-

sitions. Rather than reducing acceptance to citizen resistance or support, the analysis demonstrates how acceptance emerges from a broader configuration of actors whose actions, perceptions, and relationships co-define the conditions for acceptance. By doing so, the chapter makes two key contributions. First, it shifts the analytical focus from acceptance as an outcome to an ongoing process, moving beyond static and citizen-focused understandings. Second, it shows that engagement plays a nuanced and conditional role in shaping acceptance. It shows that acceptance is not a straightforward outcome of participation, but a weighing process shaped by the interplay of actors, their roles, and their relationship to different objects of acceptance. By unpacking community acceptance the chapter provides a more grounded understanding of how engagement relates to acceptance, and unpacks assumptions and promises of outcome-oriented participation approaches.

Chapter 3 examines assumptions embedded in dominant energy citizenship (EC) discourse. EC debates often presume that citizens can, and should, take on more active roles, and that insufficient engagement reflects a need for empowerment. Such framings reduce engagement to an abstract ideal or status to be achieved, while obscuring structural inequalities and contextual barriers that shape people's actual ability to engage. This chapter challenges these assumptions by approaching EC as a process in the making, rather than as a normative status. Drawing on underrepresented contexts, it shows how citizens' roles are embedded within institutional structures, shaped relationally, fluid over time, and co-constructed through interactions with others. Engagement is portrayed as context-dependent and extending beyond energy-related issues. Using a relational, embedded and process-oriented perspective, this chapter moves away from well-intended but restricted normative notions of EC, and reframes it as a diverse set of practices that reflect lived realities and structural conditions. This allows identification of the often-overlooked barriers that inhibit engagement, as well as recognition of alternative, less visible modes of agency. The chapter thus offers a more nuanced understanding of how energy citizenship comes about and relates to outcomes such as empowerment.

Chapter 4 examines local heat transition coordination in marginalized neighborhoods. These contexts are frequently portrayed as "hard to coordinate," with difficulties attributed to residents themselves. Such framings oversimplify citizens' roles and obscure the relational dynamics and structural conditions that shape actors' engagement and coordination. The chapter shows that engagement is underpinned by multiple, often conflicting, logics enacted by different actors. Meaningful engagement does not require full consensus, such alignment is often impossible, but rather the ability to navigate and negotiate those misalignments. Findings reveal how and why collective heat transitions often stall, particularly in marginalized settings: misalignments emerge across and within multiple actor

groups, both substantively and relationally. Challenges attributed to citizens prove to be part of broader inter-actor tensions. The chapter argues that improving coordination requires attention to transparency, time, and quality of relationships. In doing so, the chapter underscores both the potential and limitations of collective, locally driven transitions in marginalized neighborhoods.

Chapter 5 reflects on an attempt to reshape the script of 'doing' engagement through a creative approach to engagement, beyond the academic domain. In doing so, it reflects on how predefined (thematic) domains or frames shape how engagement is researched and practiced, and demonstrates the value of experimenting with alternative modes of engagement that challenge these conventions.

Together this dissertation makes two main contributions. Theoretically, it advances scholarship on citizen engagement in sustainability transitions by offering a relational, embedded, and processual perspective, thereby providing a more nuanced understanding of how engagement is formed and negotiated. This understanding challenges assumptions underlying outcome-oriented framings, and identifies where and why the promises attached to it may fail to materialize. It shifts the focus from viewing citizens as a group to be "dealt with", toward repositioning them as embedded actors whose capacity and willingness to engage are shaped by structural and relational realities. It thereby provides a nuances dominant outcome-oriented framings and contributes to more reflexive, inclusive and realistic approaches to citizen engagement in energy transitions. Empirically, it foregrounds underrepresented contexts in the Netherlands and demonstrates concrete ways and methods to embed context and relationality in energy transition research.

Ultimately, the findings emphasize the need to strengthen inter-actor relationships in order to move beyond superficial participation. They demonstrate that engagement should be understood not as a mechanism for achieving predetermines outcomes such as acceptance or empowerment, but as a practice of relating, one that contributes to more embedded, context-sensitive and durable forms of engagement.

Samenvatting
Burgerparticipatie wordt steeds vaker erkend als een hoeksteen van succesvolle energietransities. Ondanks deze brede erkenning blijven dominante benaderingen van burgerbetrokkenheid echter beperkt en sterk resultaatgericht. In zowel beleids- als academische contexten wordt participatie vaak benaderd als iets dat moet worden "afgevinkt" of "uitgevoerd": een procedurele stap in het transitieproces. Burgerparticipatie wordt daarbij veelal onderzocht in relatie tot wat zij geacht wordt op te leveren: bijvoorbeeld soepelere implementatie, meer rechtvaardigheid en legitimiteit, of de empowerment van burgers.

Dergelijke resultaatgerichte benaderingen reduceren participatie tot een instrument of ideaal, en doen geen recht aan de complexe en situatieve realiteiten van burgerparticipatie. Daarbij komt dat burgers hierdoor impliciet worden gepositioneerd als extern aan het system, als "zij", in plaats van als ingebedde actoren wiens rollen, perspectieven en handelingsruimte worden gevormd door institutionele, socio-technische en relationele contexten. Wanneer participatie te nauw wordt gekaderd, lopen participatieprocessen het risico oppervlakkig te worden, louter afvinkactiviteiten die de diepere dynamieken die burgerbetrokkenheid vormgeven niet adresseren. Zodoende blijven dergelijke benaderingen van burgerparticipatie slecht toegerust om hun beloften waar te maken indien zij geen rijker begrip hanteren van hoe betrokkenheid in de praktijk tot stand komt, of het nu gaat om beloftes van acceptatie, rechtvaardigheid of democratische legitimiteit.

Dit proefschrift adresseert dit door burgerparticipatie te onderzoeken aan de hand van een gecombineerd analytisch perspectief dat inbedding, relationaliteit, en proces centraal stelt. Het gaat daarbij kritisch in gesprek met drie terugkerende concepten die burgerrollen in energietransities benadrukken, maar dit vaak op beperkte wijze doen: draagvlak, energie burgerschap, en lokale warmtetransitie coordinatie in gemarginaliseerde wijken. De overkoepelende onderzoeksvraag luidt: *Hoe kan burgerparticipatie op een alomvattende manier worden begrepen, en welke implicaties heeft dit voor burgerparticipatie in de energietransitie?*

Empirisch kijkt dit onderzoek naar participatie in de contexten van warmte-, wind- en zonnetransities in Nederland. Het maakt gebruik van kwalitatieve data van drieënvijftig stakeholders, waaronder bewoners, verspreid over elf casestudies in uiteenlopende geografische settingen: van landelijk tot stedelijk, en van gemarginaliseerde tot meer welvarende buurten.

Hoofdstuk 2 reviseert acceptatie (=draagvlak) en adresseert een gat in ons begrip van hoe betrokkenheid bijdraagt aan uitkomsten zoals acceptatie. Bestaande studies conceptualiseren lokale acceptatie vaak als een statisch eindpunt in plaats van een dynamisch proces. Dit hoofdstuk heroverweegt draagvlak als een proces

dat ontstaat door interacties tussen meerdere actoren, die elk verschillende rollen en percepties hebben ten aanzien van diverse aspecten van energietransities. In plaats van acceptatie te reduceren tot weerstand of steun van burgers, laat de analyse zien hoe acceptatie voortkomt uit een bredere configuratie van actoren wiens handelingen, percepties en onderlinge relaties gezamenlijk de voorwaarden voor acceptatie vormgeven. Het hoofdstuk levert twee belangrijke bijdragen. Ten eerste verschuift het de analytische focus van acceptatie als uitkomst naar acceptatie als een voortdurend proces, voorbij statische en burger-gecentreerde benaderingen. Ten tweede toont het de genuanceerde en voorwaardelijke rol van participatie in het proces van acceptatie: acceptatie is geen rechtstreeks resultaat van participatie, maar een afwegingsproces dat wordt gevormd door rollen, relaties en uiteenlopende objecten van acceptatie. Door acceptatie op deze manier te ontleden, biedt het hoofdstuk een robuuster begrip van de relatie tussen participatie en draagvlak, en legt het veronderstellingen en beloften van resultaatgerichte participatie bloot.

Hoofdstuk 3 onderzoekt aannames binnen dominante discoursen over energie burgerschap. Binnen debatten over energie burgerschap wordt er vaak vanuit gegaan dat burgers meer actieve rollen kunnen en zouden moeten aannemen, en dat onvoldoende betrokkenheid duidt op een gebrek aan empowerment. Dergelijke benaderingen reduceren participatie tot een abstract ideaal of te bereiken status, en verhullen de structurele ongelijkheden en contextuele barrières die de daadwerkelijke handelingsruimte van mensen vormgeven. Dit hoofdstuk bevraagt deze aannames door energie burgerschap te benaderen als een proces in wording in plaats van een normatieve status. Op basis van onderbelichte contexten laat het zien hoe burgerrollen institutioneel ingebed, relationeel gevormd, dynamisch in de tijd, en mede-geconstrueerd zijn in interactie met anderen. Betrokkenheid blijkt contextafhankelijk en omvat meer dan louter energie gerelateerde thema's. Vanuit een relationeel, ingebed en proces georiënteerd perspectief her-kadert dit hoofdstuk energie burgerschap als een divers geheel aan praktijken dat de geleefde realiteiten en structurele condities van betrokkenheid weerspiegelt. Hierdoor worden barrières zichtbaar, evenals alternatieve, minder zichtbare vormen van agency. Het hoofdstuk biedt daarmee een genuanceerder begrip van hoe energie burgerschap tot stand komt en zich verhoudt tot uitkomsten zoals empowerment.

Hoofdstuk 4 onderzoekt de coördinatie van lokale warmtetransities in gemarginaliseerde wijken. Deze contexten worden regelmatig neergezet als "moeilijk te coördineren", waarbij problemen worden toegeschreven aan bewoners zelf. Dergelijke benaderingen vereenvoudigen de rol van burgers en negeren de relationele dynamieken en structurele condities die betrokkenheid en coördinatie daadwerkelijk vormgeven. Het hoofdstuk laat zien dat participatie wordt beïnvloed door meerdere, vaak conflicterende logica's van verschillende actoren. Betekenisvolle participatie vereist daarmee de capaciteit om deze verschillen te navigeren en te

onderhandelen. De bevindingen laten zien hoe en waarom collectieve warmtetransities vastlopen, vooral in gemarginaliseerde contexten: verschillen en spanningen ontstaan tussen én binnen actorgroepen, zowel inhoudelijk als relationeel. Problemen die doorgaans aan bewoners worden toegeschreven blijken onderdeel van bredere inter-actor spanningen. Het hoofdstuk laat zien dat betere coördinatie vraagt om aandacht voor transparantie, tijd en de kwaliteit van relaties. Daarmee laat het zowel de potentie als de beperkingen zien van collectieve, lokaal gedreven transities in gemarginaliseerde wijken.

Hoofdstuk 5 reflecteert op een poging om het "script" te herschrijven van hoe we participatie in energietransities onderzoeken. Door middel van een creatieve benadering van participatie laat dit hoofdstuk zien hoe vooraf gedefinieerde thematische kaders bepalen hoe betrokkenheid wordt onderzocht en benaderd, en toont het de waarde van experimenten met alternatieve vormen van participatie om deze conventies uit te dagen.

Dit proefschrift levert twee belangrijke bijdragen. Theoretisch draagt het bij aan het begrip van burgerparticipatie door een relationeel, ingebed en procesgericht perspectief te bieden, waarmee een genuanceerder beeld ontstaat van hoe betrokkenheid tot stand komt en wordt onderhandeld. Deze heroriëntatie bevraagt de aannames onder resultaatgerichte benaderingen en laat zien waar en waarom de bijbehorende beloften vaak niet worden waargemaakt. Het verschuift de aandacht van een beeld van burgers als een groep die moet worden aangepakt of aangesproken, naar een visie waarin burgers worden gepositioneerd als ingebedde actoren wiens capaciteit en bereidheid tot betrokkenheid worden gevormd door structurele en relationele realiteiten. Hierdoor nuanceert het dominante resultaatgerichte kaders en draagt het bij aan meer reflexieve, inclusieve en realistische benaderingen van burgerparticipatie in energietransities. Empirisch brengt het onderbelichte contexten in Nederland naar voren en toont het concrete manieren om context en relationaliteit te verankeren in onderzoek naar burgerparticipatie in energietransities.

Uiteindelijk benadrukken de bevindingen de noodzaak om inter-actorrelaties te versterken om voorbij oppervlakkige participatie te komen. Ze laten zien dat participatie niet moet worden begrepen als een mechanisme om vooraf bepaalde uitkomsten, zoals acceptatie of empowerment, te bereiken, maar als een 'praktijk van verhoudingen aangaan'. Die praktijk draagt bij aan meer ingebedde, contextgevoelige en duurzame vormen van betrokkenheid.

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Chapter 1

Introduction

1.1 Problem statement

Few challenges are as urgent and far-reaching as the transformation of our energy systems. As the IPCC emphasizes, energy transitions are among the most critical changes needed to mitigate climate change (IPCC, 2022). This transformation, replacing fossil fuels with renewable sources, is not simply a matter of technical substitution. The decentralized and variable nature of renewable energy sources introduces new demands on how we organize and coordinate energy demand and supply, spatial planning and behavioral adaptation. These changes affect daily life, social structures, and the organization of space, making energy transitions not only a technological challenge, but also a deeply social one (Miller et al., 2013).

The recognition of energy transitions as a social endeavor is increasingly reflected in both policy and academic discourse. Policy documents such as the Dutch Climate Agreement (Rijksoverheid, 2019) and scholarly literature frame energy transitions as a collective societal task (Miller et al., 2013). Within this context, citizens are recognized as crucial actors and their engagement has become a key subject of both policy attention and academic debate (Wahlund & Palm, 2022; Wittmayer et al., 2017). Citizen engagement broadly refers to the ways in which individuals and communities relate to, participate in, and influence energy systems and their transformation (Radtke et al., 2020).

Across governance, justice and system innovation literature there is growing consensus that low carbon energy transitions depend on the meaningful engagement of citizens (Jenkins et al., 2016; Miller et al., 2013; Stirling et al., 2008). Engagement is considered important for several reasons. First it is expected to enhance the effectiveness of energy transitions by fostering awareness, acceptance, and ultimately behavioral change (Bidwell, 2016; Shove & Walker, 2014). Second, it is seen as a way to strengthen democratic legitimacy and social justice of energy transitions (Chilvers et al., 2021; Köhler et al., 2019). It is argued that citizen engagement improves not only technical outcomes but also social ones (Peterson et al., 2015). In this sense, engagement is often valued against the background of effectiveness (e.g., acceptance, implementation) and justice (e.g., inclusion, equity and empowerment) of energy transitions. These rationales are clearly reflected in policy discourse. For instance, in the Dutch Climate Agreement, where public support and engagement are positioned both fundamental to success of energy transitions and considered as something 'that is essential for making the energy transition more just' (Rijksoverheid, 2019, p. 216). Similarly, European policy actively promotes citizens involvement through mechanisms like energy cooperatives, prosumer models and community energy projects (Directive 2018/2001, 2018), and embed them more directly in governance and ownership of energy systems.

Despite recognition of its importance, dominant framings of citizen engagement remain narrow and outcome-oriented. In both policy and academic contexts, engagement is frequently approached as something that must be "checked off" or "carried out", considered a procedural step in the transition process (Kluskens et al., 2024). The engagement of citizens in energy transitions is thereby frequently conceptualized against the backdrop of among other effectiveness or fairness, and thus in relation to what engagement is expected or supposed to achieve, for example contributing to smoother and effective implementation, focusing on public attitudes, perceptions and behavioral shifts (e.g., Bidwell, 2016; Cowell et al., 2011; Kok et al., 2021; Wolsink, 2012), or enhancing fairness and legitimacy, focusing on empowering citizens and addressing structural inequalities and inclusion (e.g., Köhler et al., 2019; Kok et al., 2021; Mundaca et al., 2018; Wood & Roelich, 2019).

These dominant framings of the importance of engagement are not arbitrary or misguided, but reflect broader concerns about the ethical, political and social dimensions of energy transitions. Scholars have long emphasized that energy transitions are not politically neutral and that they involve power dynamics, distributional conflicts and have democratic implications (Chilvers & Longhurst, 2016). Public engagement is therefore seen as a key mechanism (as *good to do*) to democratize energy transitions, address injustices, enhance legitimacy end ensure that transitions do not exacerbate existing inequalities, as there is growing awareness that energy transitions can reinforce existing injustices (Köhler et al., 2019). Moreover, there is evidence that integrating normative concerns, such as fairness and inclusion, can also strengthen public support for transitions (Kluskens et al., 2019; Warren & McFadyen, 2010). Köhler et al. (2019) point out that more egalitarian approaches to transitions governance are seen as necessary both to prevent the reproduction of injustice and to foster broader societal buy-in.

So, while these dominant perspectives on citizen engagement have contributed valuable insights to the social dimensions of energy transitions, they often tend to frame (the importance of) engagement in limited ways. Engagement is often conceptualized primarily in relation to specific outcomes, such as acceptance, empowerment or legitimacy. These framings tend to reduce citizen engagement to a tool or aspirational ideal, risking oversimplifying the complex and situated realities of citizen involvement.

Crucially, these dominant framings tend to position citizens as external to the system, treating them as targets of intervention or beneficiaries of empowerment, a "them", rather than as embedded actors whose roles, perspectives and agency are shaped by institutional, socio-technical, and relational contexts. This externalizing view risks reinforcing a deficit model of the public, where citizens are seen either as obstacles to be overcome (Kluskens et al., 2024), passive recipients, or as

insufficiently engaged (Beauchampet & Walsh, 2021; Devine-Wright, 2007a), rather than as co-constructive participants in transition processes. It overlooks that citizens are already entangled in energy systems through everyday practices, institutional arrangements and socio-technical contexts, and that their engagement is thus "both diverse and socially constructed" (Chilvers et al., 2021, p. 250).

Moreover, these narrow framings face both practical and conceptual challenges. So far, research shows, the effectiveness and thus importance of engagement in achieving outcomes such as acceptance, fairness or democratic legitimacy remains questionable (Jasanoff, 2018; Radtke, 2025). Current forms of engagement often fall short of producing meaningful change (Beauchampet & Walsh, 2021) or increase legitimacy (Jasanoff, 2018). Even well intended approaches may even exclude more than they include, as illustrated by the "participation paradox", where efforts of invited involvement inadvertently lead to reduced participation (Van der Meer, 2018). Calls for empowerment may also place undue pressure on individuals to participate without addressing the structural inequalities that shape their ability to do so (Lennon et al., 2020). Furthermore, these dominant framings often imply that certain groups must be empowered without critically examining whether those groups are already engaged in meaningful ways, with heterogenous attachments to energy, that are invisible to dominant perspectives (Walker & Cass, 2007). As Chilvers et al. (2021) show, different forms of engagement exists, and the way we frame engagement determines which forms are recognized and which ones are overlooked.

These dominant perspectives on citizen engagement have thus not demonstrably accelerated energy transitions or ensured greater equity (Chilvers et al., 2021). In line with Chilvers and Longhurst (2016), in this thesis, it is argued that these limitations stem from their narrow conceptualization of engagement. By reducing engagement to an instrumental tool, aspirational ideal, or external act, these framings overlook the complex and situated realities of how citizens are involved in energy transitions. This narrowness poses significant risks: when engagement is narrowly framed, (calls for) participation risk(s) becoming superficial, a mere checkbox exercise that fails to address deeper dynamics shaping citizen involvement. As such, narrow framings of the importance of citizen engagement remain ill-equipped to deliver on their promises, whether of acceptance, fairness, or democratic legitimacy, without a deeper understanding of engagement of citizens in energy transitions.

This dissertation responds to this, by proposing a more nuanced perspective on citizen engagement, one that foregrounds embeddedness, relationality, and process. Rather than starting from treating engagement as an abstract ideal, functional tool, or solely an external act, this approach instead recognizes the complex realities of citizen engagement processes as being co-constructed within institutional,

socio-technical and everyday contexts. By adding this perspective to dominant framings, it allows to critically examine and improve these more outcome-oriented approaches, bringing them into dialogue with the diverse lived realities of citizen engagement. All in all, this research explores how these framings can be theoretically enriched and better aligned with diverse lived realities of citizen engagement, offering a more nuanced understanding of both promises and limitations of these framings regarding citizen engagement.

By doing so, this dissertation seeks to open up new pathways for understanding the role of citizens in energy transitions. It not only asks how current dominant perspectives can be improved and complemented, but also examines what these insights possibly mean for the outcome-oriented promises (among others effectiveness and justice) of engagement. This research' aims are thus twofold: to refine existing narratives around citizen engagement, and to foster a more grounded and realistic conversation about the role of citizen engagement in shaping sustainable energy futures.

This leads to this dissertation addressing the following main research question: *How can citizen engagement be understood comprehensively, and what implications does this have for citizen engagement in energy transitions?*

To address this overarching research question, the research engages critically with three reoccurring concepts in energy transition debates that foreground the importance of citizen roles but often do so in reductive or limited ways: community acceptance, energy citizenship, and heat transition coordination in marginalized settings. These concepts are not presented as separate theoretical commitments, but as analytical entry points for examining how citizen roles and engagement are enacted and framed in practice. Rather than imposing a single overarching framework, the thesis adopts an analytically layered approach in which coherence does not rest on adherence to one grand theory, but on a shared ontological and epistemological stance. Engagement is not treated as a discrete intervention, measurable outcome, or normative end-state, but as an embedded, relational, and processual phenomenon that unfolds over time. Whether examining acceptance, citizenship, or coordination in marginalized settings, the core analytical endeavour remains to understand how citizen engagement is constructed, negotiated, and stabilized within specific institutional and socio-technical contexts. This shared relational, embedded and processual perspective provides coherence across the different conceptual vocabularies employed in this thesis.

What unifies concepts such as acceptance, energy citizenship, and coordination is not their substantive similarity, but their predominantly outcome-oriented framing. They often foreground citizen roles while implicitly framing engagement in terms

of measurable end-states or idealized achievements (e.g., acceptance, empowerment or coordination (to be) accomplished). The critique developed here is not directed at these concepts per se, but at the tendency within policy and academic discourse to reduce engagement to such endpoints. By re-situating these concepts within a relational and ongoing understanding of engagement, the thesis allows for a deeper interrogation of the assumptions embedded in dominant engagement narratives, and opens space for alternative engagement approaches that are more attentive to diverse lived realities. A further elaboration of this analytical approach is provided in Section 1.2.

In that regard, the research problem and gaps are explored through four sub-questions, each corresponding to one of the three empirical chapters and the final essay chapter:

1. How does community acceptance come about in RET projects?
2. How and why do citizens assume particular roles in energy transitions and how do these enactments inform a more comprehensive understanding of energy citizenship in heat transitions?
3. What tensions characterize neighborhood heat transitions, and where lie leverage points for advancing collective heat transitions?
4. How can we change the script of citizen engagement in energy transitions?

1.2 Research design and theoretical foundations

By combining a more nuanced understanding of engagement with dominant more outcome-oriented framings, this thesis positions itself within the broader debate on public engagement in sustainable energy transitions. This dissertation recognizes that this is a vast and interdisciplinary field. This thesis' contribution lies in bringing insights from Science and Technology Studies (STS) in conversation with the more governance-oriented Sustainability Transitions (ST) literature. Where STS approaches often seek to understand engagement as co-constructed and emergent, ST tend to focus on how engagement can be organized or steered to support systemic change towards sustainability (Chilvers & Longhurst, 2016). On the one hand, sustainability transitions scholarship has made an important contribution by embracing citizen engagement as central, indeed often instrumental, to achieving sustainable energy transformations. However, this instrumental framing can also flatten the concept, as the multiple realities and dynamics of engagement risk being overshadowed by its functional role in delivering transition outcomes.

For this reason, the thesis adopts an STS-inspired view of engagement, not to dismiss or replace the instrumental dimension of engagement, but to complement and deepen it. This dissertation is normatively committed to sustainable transitions. It does not question the necessity of transforming energy systems in light of climate

change, nor does it reject the importance of citizen engagement in this process or an outcome-oriented focus per se. Rather it argues that when the relational and constructed dynamics of engagement are insufficiently examined, there is a risk of false closure about what engagement is and how it contributes to sustainable energy transitions outcomes. It thus problematizes that dominant framings may unintentionally constrain the very transformative ambitions they seek to advance.

The analysis foregrounds how transition approaches materialize in concrete local contexts. In doing so, it grounds transition ambitions more firmly in the diverse lived, institutional, and relational realities through which they unfold. The thesis thus complements structural transitions approaches by zooming in on the dynamics of local transition practices, here specifically engagement, and the processes through which engagement is interpreted, contested, and enacted. In this way, it positions itself within sustainable energy transitions debates while bringing them into dialogue with constructivist perspectives that emphasize relationality, meaning-making, and the coexistence of diverse realities in local transition processes. This thesis thus draws upon STS and ST, aiming to foster dialogue and cross-pollination between constructivist and more outcome- and governance oriented approaches to engagement.

Within these broad debates, and acknowledging that the entirety of the engagement literature cannot be covered, this thesis focusses on three key themes that are central to dominant framings of engagement in energy transitions: community acceptance, energy citizenship and heat transition coordination in marginalized settings. These themes are widely discussed in both policy and academic discourse, yet they often portray a narrow conceptualization of engagement. Within this research these themes are examined in the context of local energy transitions, thus in the context of energy transition implementation level.

This research positions citizens as central unit of analysis. Their engagement and positions are examined through a combined *embedded, relational* and *process-oriented* lens. In this view, actors are situated in specific contexts and in interaction with other actors, each guided by different normative assumptions and possibilities that shape their engagement. Engagement is therefore not seen as an external act, but as something continually shaped through relations, practices and meanings (Chilvers & Kearnes, 2020; Chilvers & Longhurst, 2016). With this combined lens on actors, the following is meant:

In this research actors are analyzed as embedded, inherently shaped by institutional structures, everyday life, and informal practices. A common critique in engagement literature is that it tends to analyze or understand participation in isolated "parts" of the system, either in formal decision making processes or in

domestic settings (Chilvers & Longhurst, 2016), without attending to how these domains co-create each other. This thesis' analysis, by contrast, considers both institutional practices and everyday life and how these jointly construct engagement at the local level (thereby considering multiple "parts" of the system at the local level). This allows to see how different parts of the system interact at the local level and how they jointly co-construct and embed engagement. It also means the research is not limited to invited forms of participation in formal "transition arenas", as often foregrounded in outcome-oriented engagement discourse (Stirling et al., 2008), but also attends to forms of engagement outside these arenas and examines how they relate to, and influence more formal processes. Rather than focusing on discrete instances, this research analyses how engagement emerges across institutional and everyday domains, and how these domains are related.

Secondly, actors are analyzed not as isolated individuals or homogenous groups, but in relation to other actors. Engagement is therefore understood as a relational practice: citizens influence and are influenced by others, and their positions only take shape in these interactions. This analysis thus moves beyond the notion of "the public" as a singular entity, toward recognizing publics are diverse and multiple (Chilvers et al., 2018; Pallett et al., 2019; Walker & Cass, 2007), co-constituted through their relations with each other and with institutions.

Thirdly, citizens' positions or engagement are approached as something emergent, evolving, and changing over time, rather than as something fixed, linear or predetermined. Actors' engagement is thus analyzed as a process, continually in the making, over time.

By examining acceptance, citizenship and coordination in vulnerable communities through this perspective of citizen involvement in energy transitions, this thesis contributes in two ways. First, it advances a deeper understanding of these concepts itself, showing how they are framed and enacted in practice. Second, it develops theoretical and empirical insights into the promises and limitations of dominant, more outcome-oriented, engagement framings. In this way the thesis not only refines dominant conceptualizations of acceptance, citizenship and vulnerability, but considers what these insights mean for how engagement is framed and practiced in energy transitions.

The section below discusses the theoretical concepts that guide this thesis and explains how they are mobilized to advance a more nuanced understanding of citizen engagement.

In the context of energy transitions, the notion of social acceptance, often referred to in Dutch debates as *draagvlak*, has traditionally been framed as important for

the success of policy or project development (Wüstenhagen et al., 2007). Within this position, much of the literature has focused on explaining public or community acceptance as either present or lacking (e.g., Batel, 2020) and particularly why acceptance seems unproblematic at a general level but becomes a problem at the local level (Aitken et al., 2008; Devine-Wright, 2011). However, this framing is problematic given that the objects and issues of acceptance differ so fundamentally across levels, that direct comparison, or seeking the problem at the local level, is conceptually unsound (de Wildt et al., 2021; Ellis & Ferraro, 2016; Kluskens et al., 2024). Despite this, the focus on local acceptance has long contributed to a framing in which the local community is seen as the problem, and citizens are positioned as obstacles to be overcome. Within this framing, a key claim is that engagement and participation are linked to the creation of acceptance (Gross, 2007; Wolsink, 2007a). Engagement is thus treated as a tool, alongside other factors such as the aesthetics of technologies (Petrova, 2013; Whitmarsh et al., 2019) to secure local support.

Yet, the empirical evidence for this instrumental relationship is fragmented and inconsistent, and it remains unclear whether, and how, participation actually contributes to the successful realization of energy projects (Radtke, 2025). A key issue that we see is that acceptance is typically examined as an outcome. Consequently, we lack a clear picture of how acceptance is formed (the dynamics that shape acceptance remain poorly understood), including the role that engagement plays in shaping it (Kluskens et al., 2024). To address this, Chapter 2 reconceptualizes acceptance as a process in the context of local renewable energy technology (RET) implementation, focusing specifically on wind and solar projects. Using local actors as unit of analysis, we examine how different elements (actors, their roles, perspectives and the objects of acceptance) interrelate in the process of acceptance over time. We show new insights in how acceptance develops in practice and turn to critically assess the narrative that positions engagement as a tool for creating acceptance.

In this energy context, citizens were until recently primarily conceptualized as passive consumers, and their role was mainly addressed against the instrumental backdrop of generating public acceptance (Wahlund & Palm, 2022). More recently they are seen as vital and active agents in accelerating energy transitions. This shift in conceptualization is encapsulated in the concept of energy citizenship (EC) (Devine-Wright, 2007a). A substantial body of research has already examined different forms of participation in energy transitions (Chilvers et al., 2018), as well as diverse expressions of citizenship (Lennon et al., 2020; Vihalemm & Keller, 2016). Yet, while the concept of EC engages with new roles and responsibilities for those 'active' citizens, it often carries a strong normative charge as it assumes citizens wanting and being able to take on certain roles, and that such empowerment inher-

ently leads to justice in energy transitions (Kluskens et al., 2025). This active role and thus empowerment of citizens is actively promoted in policy discourse and is frequently treated as something 'good' in itself (European Commission, 2019).

In this sense, EC is often presented as an idealized vision of "empowered citizens," but the concept engages too little with the structural processes, frictions, and conditions that shape how citizenship can actually be enacted (Lennon et al., 2020). As a result, it does not sufficiently account for structural barriers and injustices that prevent people from taking on certain roles. We think this is reinforced by the observation that, in popular framings, citizenship is rather understood as a status, something individuals (are ought to) possess or achieve, rather than as a practice in the making (Kluskens et al., 2025). In the engagement literature this normative orientation is strongly emphasized, yet it remains questionable whether it is effectively able to advance aims of more just and inclusive energy transitions, particularly when the structural barriers and the situated contexts of citizenship are insufficiently understood. To challenge these normative underpinnings, Chapter 3 of this dissertation examines how and why individuals assume particular roles and responsibilities in local heat transitions, and how this can inform a more comprehensive understanding of EC. By focusing on the interactions between multiple actors, we analyze how EC is constructed within complex institutional fields in neighborhood heat transitions, especially in marginalized neighborhoods. Through a more comprehensive understanding of EC, we are able to better identify barriers in the formation of EC, and to critically engage with the dominant narratives in engagement debates.

Within this context, marginalized communities are often portrayed in energy transition research as a particular "difficult" group when it comes to engagement. They are framed as being in even greater need of empowerment (DellaValle & Czako, 2022), given that sustainable initiatives are frequently recognized as socio-economically exclusive (Walker & Cass, 2007). At the same time, they are often discussed *about* as a special target group that is even harder to reach, less interested and therefore less active (Beauchampet & Walsh, 2021). This is especially evident in the context of heat transitions, where challenges extend beyond technical aspects into the realm of social coordination (Sovacool & Martiskainen, 2020), since interventions literally enter people's homes. Precisely for this reason, alignment across multiple actors is essential, yet it appears to be especially difficult in marginalized neighborhoods.

In practice, (collective) heat transitions in these areas rarely materialize (Kluskens & Höffken, 2026). Research has examined the complexities of heat transitions and perceptions of multiple actors, but most studies analyze actors in isolation. In addition, especially in policy domains we observed actors reduce citizens often to

simplified representations: uninterested, incapable, or even root cause of delay. This reinforces an instrumental logic in which marginalized residents are constructed as barriers to coordination and governance, and thus as actors that must be empowered, unburdened, or compensated in order for transitions to succeed. Yet, particularly in heat transitions, where coordination across multiple actors is crucial, this portrayal risks oversimplifying the role of citizens and overlooking the relational dynamics that actually shape their perceptions and engagement. Understanding actors' visions and actions without considering their relational context risks misinterpreting the roots of conflict and obscures what makes neighborhood heat transitions especially complex. To address this gap, Chapter 4 combines an understanding of acceptance as a process with the concept of institutional logics to examine the multiplicity of reasoning systems that inform engagement. Here, "logics" are not conceived as macro-institutional orders in the classical sense, but as issue-specific and practice-based configurations that connect values, problem framings, and preferred solution pathways. They refer to patterned and institutionalized constellations of assumptions and intervention rationales that structure how actors engage in heat transitions. By situating marginalized residents in relation to other key actors, such as municipalities and housing corporations, we analyze how engagement is constructed and negotiated in practice. This relational approach allows us to move beyond superficial assumptions about 'difficult' citizens and to critically engage with framings of engagement that dominate in marginalized settings.

Chapter 5 brings together several observations in the form of an essay. First, policy makers observably repeating practical problems with engagement, framing people as being "hard to reach", "unwilling" or "difficult to engage". Second, our own empirical data revealing a much wider range of forms and barriers to engagement, and thirdly, in line with existing literature, observing that many policy frames of energy transitions themselves only enable a limited repertoire of engagement practices (Bronsvoort et al., 2023). These observations motivated a shift from analyzing engagement to a concrete intervention: the development of a concrete tool in collaboration with designer Lisa Mandemaker, *The Energy Futures Prep Pack,* presented at Dutch Design Week 2024. Rather than working from existing policy frames, this tool experiments with co-creating alternative frames for thinking about energy and its future. In doing so, the experiment shifts focus from instrumental production of knowledge to facilitating dialogue, imagination, and alternative ways of engagement that are grounded in people's lived contexts rather than in the energy transition frame itself. In this chapter, the researcher discusses the intervention itself, reflects on our own role as researchers in producing knowledge about engagement, and considers how this informs our view on engagement and its promises.

1.3 Methods

This research explores a more nuanced understanding of citizen engagement and its implications for how engagement is approached in energy transitions. It is grounded in a constructivist worldview and draws on a qualitative research approaches to understand lived experiences and constructed realities of multiple actor in energy transition contexts (Creswell & Creswell, 2017). A qualitative research design is particularly well-suited for this inquiry, as it allows for deep exploration of meaning-making, stakeholder perspectives, and the situatedness of energy transitions processes within diverse local realities.

The study employs a multiple in-depth case study approach, encompassing eleven cases (n=11) across different local energy transition contexts in the Netherlands. Case studies are well-suited for in depth examination of complex phenomena in context (with multiple actors and institutions), and for identification of patterns across diverse settings (Gerring, 2004). Case selection was guided by theoretical relevance, prioritizing empirically underrepresented contexts in energy engagement literature, and contextual diversity. The sample includes local energy transition contexts across heat, wind and solar energy transitions, and spans a range of socio-spatial characteristics, including rural and urban areas, as well as marginalized and affluent communities. By deliberatively sampling across both structural features and contextual variation, the study aims to capture local dynamics, while generating insights that may be generalizable across settings.

Data collection for this research took place between 2021 and 2024 and involved a combination of qualitative methods. These methods underpin the study's constructivist orientation and chosen case study design, allowing for a rich and situated understanding of engagement practices in energy transitions. The primary data collection method consisted of semi-structured interviews with fifty-three (n=53) stakeholders, including residents, policy makers, project developers and other actors involved in local energy transition processes. Interviews were conducted[1] using semi-structured interview guides, which allowed for both consistency across cases and flexibility to explore emergent themes. The interview guides used in this study are included in Appendix B and D. In addition to interviews, field observations were conducted during site visits. These observations offered valuable contextual information. Moreover, in addition to primary data, secondary data was collected through project and policy documents. These sources provided insights into institutional arrangements and formal narratives surrounding energy transition initiatives.

The analytical strategy followed an inductive approach, incorporating among others process and elaborative coding cycles (Saldaña, 2016) that were executed in the software tool NVivo 12 Pro (*QSR International Pty Ltd.*, 2018). In some chapters

these inductive insights were complemented or compared with deductive themes derived from existing literature. This allowed for an abductive reasoning process that bridges the empirical insights with theoretical reflection. This approach enabled the study to generate grounded understandings of engagement while contributing to broader conceptual debates on engagement in energy transitions scholarship. More details about data collection and analysis, including coding, can be found in Chapters 2-4, as well as in Appendix A-E.

This research was conducted in parallel with, and funded by, the Flexinet project, a NWO research initiative focused on the development of hybrid energy storage technologies for flexibility innovation in energy systems[2]. While the empirical data were gathered independently, findings and reflections from this thesis contributed to and informed the conceptual development of research deliverables within Flexinet, particularly on debates about engagement and social dimensions of flexibility. Through this process, findings from the locally embedded and relational analysis in this thesis were translated and integrated into the more technical context of Flexinet, and insights were shared through workshops and collaborative exchanges throughout the projects' duration.

In addition to empirical research, the researcher was involved in the development of a new participatory method for understanding energy in energy transitions, thereby contributing to conceptualizing energy and energy futures in energy transition debates. Although not part of the formal case study design, this methodological engagement fostered public dialogue and critical reflections on energy imaginaries. Rather than producing empirical findings for analysis, this initiative facilitated co-creation and expression, which was showcased in an exposition at Dutch Design Week (DDW) 2024. The materials produced by participants were not analyzed but were presented as they emerged, and contributed to a broader societal debate beyond the academic realm.

1.4 Thesis outline

The four sub-questions of this dissertation are addressed in Chapters 2-5. These chapters are based on three published scientific articles, and an impact essay.

Chapter 2 addresses sub-question 1 by reconceptualizing community acceptance as a dynamic process, drawing on literature on social acceptance, community acceptance, engagement, and empirical data on wind-and solar projects in the Netherlands. It presents the different dimensions of community acceptance and examines the role of engagement in bringing acceptance about.

Chapter 3 addresses sub question 2 by exploring how and why individuals assume particular roles and responsibilities in energy transitions and how this can inform a more comprehensive understanding of energy citizenship. The chapter highlights both limits and opportunities of energy citizenship in the context of heat transitions in marginalized neighborhoods in the Netherlands.

Chapter 4 addresses sub question 3 by combining a process perspective on acceptance with institutional logics. It analyzes the multiple meaning systems underpinning actors' engagement and identifies leverage points for overcoming stagnation in multi-actor processes.

Chapter 5 is written as an essay. It describes the development of the "Energy Futures Prep Pack", a tool and concrete intervention designed in collaboration with designer Lisa Mandemaker as part of the project Collaborations for Future. The experiment facilitates debate on reimagining energy futures beyond systems thinking to explore alternative frames for engagement.

An overview of the publication statuses of the chapters is summarized in Table 1.1.

Table 1.1. Overview of chapter publication status

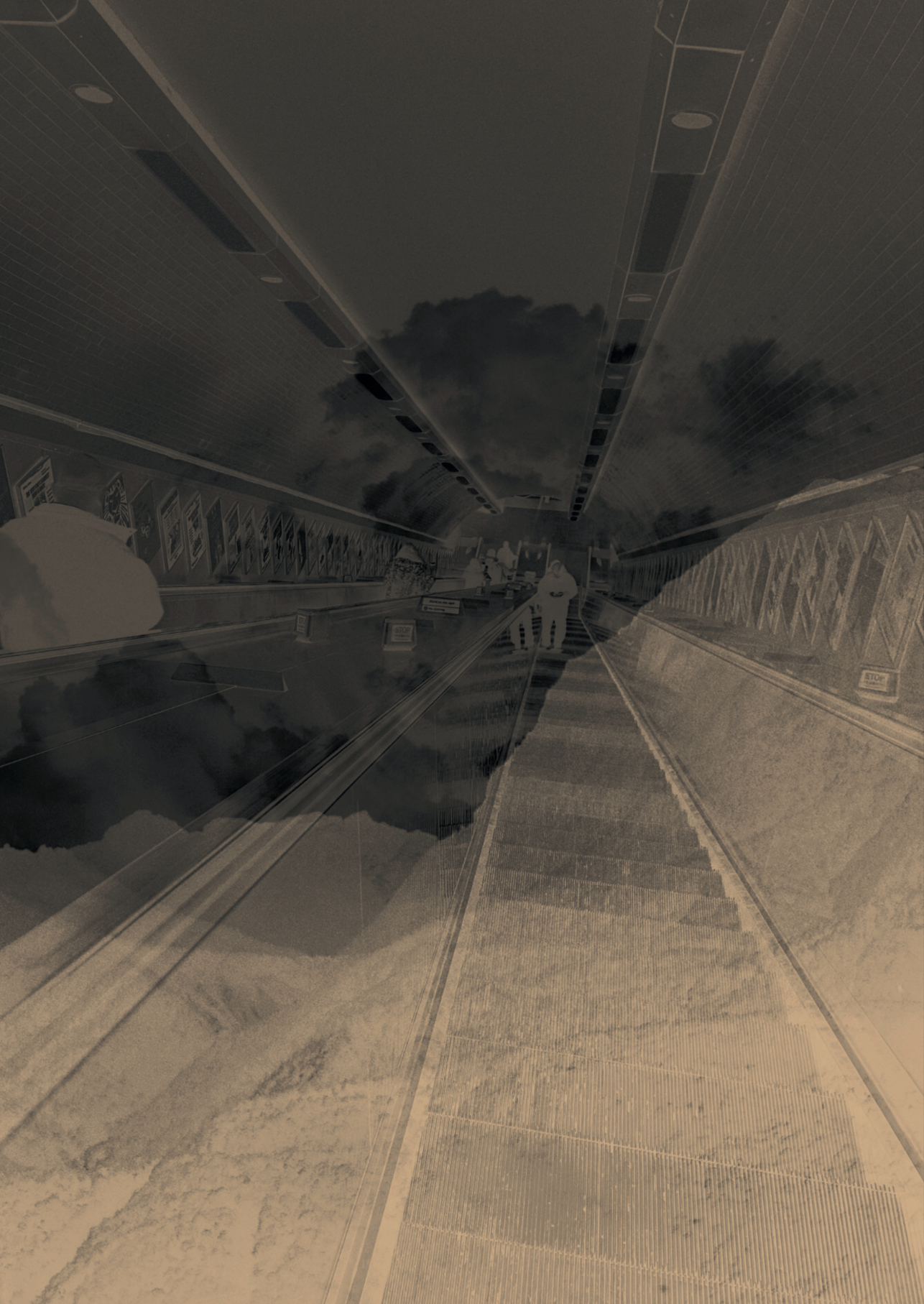
Chapter 2	Published as	Kluskens, N., Alkemade, F., & Höffken, J. (2024). Beyond a checklist for acceptance: understanding the dynamic process of community acceptance. *Sustainability Science*, *19*(3), 831-846.
Chapter 3	Published as	Kluskens, N.T.T.M., Höffken, J. I., & Alkemade, F. (2025). Exploring opportunities and limits of energy citizenship in Dutch heat transitions. *Energy Research & Social Science*, *127*, 104184.
Chapter 4	Published as	Kluskens, N. T.T.M., & Höffken, J. I. (2026). From tension to transformation in Dutch heat transitions: Leveraging time, transparency, and relationships. *Energy Research & Social Science*, 134, 104626.
Chapter 4	Essay	Kluskens, N.T.T.M., Reimagining Energy Futures Beyond Systems Thinking

Next to the 4 chapters mentioned above, the lead author also has several other contributions to her name, or contributions which are forthcoming:

- Kluskens, N., Vasseur, V., & Benning, R. (2019). Energy justice as part of the acceptance of wind energy: an analysis of Limburg in the Netherlands. *Energies*, *12*(22), 4382.
- Wieczorek, A. J., van Bommel, N., El-Feiaz, A., Kluskens, N., Niet, I., van Summeren, L., Höffken, J.I., Alkemade, F., Van den Berghe, L.., Meloni, C., Graditi, G., & Di Somma, M. (2024). Energy Communities as an Alternative Way of Organizing the Energy System in Europe: Key Societal Aspects. In *Integrated Local Energy Communities: From Concepts and Enabling Conditions to Optimal Planning and Operation*, 353-388. Wiley-VCH.
- Kluskens, N.T.T.M., Niet, I.A., Van Bommel, N., Van Summeren, L.F.M. (2025). Flexible and Just: ICT in flexibility energy communities- *under review*
- Opinie Energiearmoede: "De Winnaars van de energietransitie zijn de welgestelde burgers", Nikki Kluskens & Kees van der Wel, published in *NRC*.

Eindnoten

1. In accordance with and with approval of the standards set by the Ethical Review Board of Eindhoven University of Technology.
2. Flexinet | www.tudelft.nl/flexinet


STOP
STOP

Chapter 2

Community Acceptance

This chapter is based on Kluskens et al., (2024)

Abstract
Community acceptance is considered a prerequisite for successful energy transitions and the uptake of renewable energy technologies (RET). While policy and research often focus on acceptance as an outcome, the process of acceptance remains a black box, especially in uncontested RET implementation contexts. We study the dynamic process of community acceptance where (1) different actor groups can have (2) different roles and (3) different active and passive responses towards (4) different objects of acceptance within the RET project implementation. Results show that community acceptance occurs over time and goes beyond citizen or resident acceptance alone. By unpacking different dimensions of acceptance, we show that even in uncontested cases, acceptance is ambiguous and includes various responses toward various objects. Furthermore, we see that roles can influence and interact dynamically with responses and that preferences for roles are heterogeneous. To move beyond acceptance as a merely coincidental outcome, but a widely embraced and intentional process, this process should meet participatory needs of different actors.

2.1 Introduction

Climate change and its severe consequences for humanity call for urgent system change. Against this background, the Netherlands has committed to go from a fossil-based energy system towards a renewable energy-based system (Rijksoverheid, 2019). One theme that gets explicit policy attention is the societal acceptance of the energy transition in general, and of renewable energy technology (RET) projects more specifically (Rijksoverheid, 2019). For example, the Regional Energy Strategies, part of the Dutch regional implementation plans for the energy transition, emphasize the significance of acceptance for executing energy transition plans and projects (NPRES, 2021).

This focus on acceptance in the policy domain is strongly linked to the idea of overcoming community-level opposition and implementation delays, for example through public engagement by which acceptance is to be achieved. Less interest and attention are being paid to the underlying dynamics of acceptance. This outcome-oriented focus contrasts with recent literature promoting a more critical approach to social acceptance as a process (Batel & Rudolph, 2021; Wolsink, 2018).

Nevertheless, a lot has been written about social acceptance in the context of this outcome-oriented realm. Literature reveals that lack of public acceptance can indeed hinder achieving renewable energy innovation and related infrastructures. Hence, public acceptance is seen as one of the conditions for successful energy transitions (Chilvers et al., 2018; Devine-Wright, 2017; Wüstenhagen et al., 2007). Particularly, the failure or delay of RET implementation is mainly discussed against the backdrop of local community opposition. Indeed, examples where non-acceptance led to delays or even cancellations of renewable energy innovations are plentiful (Aitken et al., 2008; Devine-Wright, 2011), and suggests that the community level is the level where gaining acceptance seems the most problematic.

Early scholarly work moved from NIMBY (not in my backyard) explanations toward understanding the socio-psychological and context-specific factors influencing community opposition (Batel, 2020). Notably, a substantial portion of community acceptance research has been focused on identifying factors that explain acceptance as an outcome rather than a process.

While seeking explanations for community acceptance, it is notable that research into community acceptance of local RET implementation rarely focuses on discrete uncontested cases. Acceptance research is predominantly based on large-scale surveys of people's opinions about hypothetical project plans for RET, or on discrete cases with outspoken opposition (Devine-Wright, 2007b). Commonly, factors such as timely information and participation are considered important for influencing acceptance (Petrova, 2013; Whitmarsh et al., 2019), but pinpointing

universal explanations for community acceptance remains challenging as most work is based on individual hypothetical acceptance case studies and outspoken opposition cases alone (de Wildt et al., 2021; Ellis & Ferraro, 2016).

Recent academic discussions advocating a process-oriented approach to acceptance (Batel & Rudolph, 2021; Wolsink, 2018) raise questions about potential difference in how acceptance is understood compared to this outcome-focused policy approach, particularly in uncontested RET implementation. What is missing is a deeper understanding of how acceptance of local RET plans and projects comes about, especially within a context that can be considered successful administratively.

This paper addresses this gap by answering the question: How does community acceptance come about in RET projects? We aim to provide a better understanding of community acceptance in two ways. First, we move away from studying acceptance as an outcome. Instead, we follow the approach suggested by Aitken (2010), Batel et al. (2013), and Huijts et al. (2019), and study acceptance as a process over time in the context of local RET implementation. We analyze the processes of RET project implementation, the actors involved in shaping the project, and those affected by it. We specifically study how different elements (actors, roles, responses, and objects) interrelate in the dynamic process of acceptance. Second, we provide an empirical counterbalance to the existing literature by examining discrete RET projects that have been successfully implemented without formally articulated opposition. Conceptualizing and understanding the process of acceptance will not only bring more conceptual nuance and clarity to the acceptance debate, but it is also pivotal to identify leverage points for policy and citizens to influence the energy transition.

The paper proceeds as follows. Section 2.2 will unpack the notion of community acceptance, and factors identified in the literature as important for acceptance. Section 2.3 discusses the methods used for this research. Section 2.4 provides the results of an empirical study of uncontested and implemented RET projects. Section 2.5 presents the discussion followed by the conclusion in section 2.6.

2.2 Theoretical background Community Acceptance

We see community acceptance as the acceptance process of a specific RET project implementation by local stakeholders. Based on literature research[3], we identify four different dimensions of the process of community acceptance: the actors involved (who), the roles of these actors, the objects of acceptance (what), and the various responses (how).

2.2.1 Actors and roles

Community acceptance is a facet of social acceptance (Wüstenhagen et al., 2007). According to Wüstenhagen et al. (2007), social acceptance consists of three interdependent facets: community acceptance, socio-political acceptance, and market acceptance. Community acceptance refers to the acceptance of concrete RET project implementation (e.g., wind turbine implementation), whereas socio-political acceptance encompasses general acceptance (e.g., wind energy as an energy source). Market acceptance pertains to the diffusion of a certain technology and its adoption by the market.

Expanding upon this paradigm, Wolsink (2018) illuminates the dynamic and systemic nature of the acceptance process. He underscores the interplay between community acceptance, market acceptance, and socio-political acceptance, each dynamically informing and shaping the other through interactions of diverse stakeholders that can play different roles in different phases of the renewable energy implementation process (Van Rijnsoever et al., 2015; Wolsink, 2010).

Socio-political acceptance manifests through the public, key stakeholders, and policymakers, and market acceptance through interaction between consumers, investors, and firms. For community acceptance, the interactions between local authorities, local stakeholders, and local residents are key (Landeta-Manzano et al., 2018; Wüstenhagen et al., 2007). It thereby goes beyond the notion of citizens or residents as the only relevant group expressing acceptance and it explicitly looks at citizens as part of a community.

Although community acceptance does not exist in isolation and is one facet among others (Ellis & Ferraro, 2016; Wolsink, 2018), we specifically zoom in on what dynamics and processes are at play at the community level.

The role that actors take or that is allocated to them in society allows them to shape community acceptance processes and the RET project through different forms of engagement and social interaction in energy transition discourse and processes (Van Rijnsoever et al., 2015). Traditionally, much research has focused on more influential roles of residents in relation to acceptance, often assuming the two are inseparably linked. However, more recent studies have moved beyond this resident-centric focus, exploring the various roles that multiple actors can have within RET processes and how actors react and adapt these roles over time (Chilvers & Longhurst, 2016; van de Grift & Cuppen, 2022). Moreover, some of these actors are assigned explicit formal or informal roles in the process and can actively (or passively) shape the acceptance process. Important to note is that these roles can be informed by formal and informal procedures, but can also be more reactive in nature, for example triggered by certain responses (van de Grift & Cuppen,

2022). In our analysis, we therefore explicitly consider different actor groups and the various actor roles that are relevant in the local interaction to understand the dynamics on the community level and how they come about.

2.2.2 Responses

What complicates the understanding of acceptance as a process is that the term is interpreted in various ways and often relates to a certain response or outcome. In this outcome-oriented realm, acceptance has related connotations like acceptability, support, and tolerance that are often used interchangeably (Busse & Siebert, 2018). In addition, these terms are often loosely defined or not defined at all (see e.g., Busse & Siebert, 2018; Perlaviciute et al., 2018). On top of that, there is barely uniformity in the operationalization of acceptance, meaning that acceptance measurements vary widely (see Batel et al. (2013) for examples of how acceptance is measured).

Some scholars see acceptance as one possible outcome, alongside other outcomes like tolerance, support, and opposition (Petrova, 2013). Perlaviciute et al. (2018) understand acceptance (next to apathy, support, etc.,) as one of the possible manifestations of acceptability, which they define as a broad concept that refers to people's general evaluation of energy projects. 'It manifests itself in people's opinions as well as their (intended) actions and can be accompanied by emotional responses to these projects.' (Perlaviciute et al., 2018, p. 50).

Batel et al. (2013) empirically distinguish acceptance from support. They consider support a more active form of acceptance that implies a favorable position towards the project whereas acceptance is a more passive response. Bertsch et al. (2016) understand acceptance not as a single outcome, but as a range of possible approval responses towards renewable energy technologies and policies, from passive to active. We follow this definition in understanding the process of acceptance as it allows for considering 'silence' (not resisting, but also not supporting renewable energy deployment) as a response. Considering silence as a form of response can give valuable insights into the response dynamics of non-outspoken actors, and possible response dynamics that are part of uncontested RET processes.

Responses in the process of acceptance are not shaped in a vacuum (Walker et al., 2013) but rather through engagement with the energy project, negotiations, and social interaction (Dällenbach & Wüstenhagen, 2022; Jones & Eiser, 2009; Wiersma & Devine-Wright, 2014). The literature on social acceptance has identified many factors that influence acceptance. As can be seen in Figure 2.1 (Appendix A) different factors seem of importance for community acceptance (e.g., participation and distributional justice). While these factors give insights into what seems im-

portant for acceptance, they do not show how they interrelate in a process and to what extent they are steering factors for acceptance.

2.2.3 Objects of acceptance

A final dimension of the acceptance process is the object of acceptance: 'what' is accepted. System change towards a sustainable energy system affects actors in many ways and requires alterations on several aspects. As Wolsink (2012) addresses in the context of wind power, there are many decisions connected to wind energy implementation. More concretely, 'what' is an object of acceptance in the socio-political dimension (e.g., wind energy as a source in a socio-technical system) might not correspond with the acceptance object in the community acceptance dimension (e.g., spatial implementation of a specific wind energy project). The distribution of decision-making across scales, from international to local, often results in more concrete decisions on the local level (Perlaviciute & Squintani, 2020). Thus, 'what' is being decided upon differs across scales. This shows the multiplicity of different objects and their characteristics that can be subject to responses across different scales of implementation (de Wildt et al., 2021; Wolsink, 2012).

Empirical work shows that on a local level, this often comes down to decisions on concrete projects, the location of RET, the types of RET, the process, and the distribution of benefits (Perlaviciute & Squintani, 2020). Also, the specific forms of distribution of benefits or characteristics of the process can influence the overall acceptance (Cowell et al., 2011; Langer et al., 2017). We specifically look at what objects the subjects of acceptance relate to in the process of community acceptance.

Acceptance is not a one-time decision and it is not static (Küpers & Batel, 2023). As Wolsink (2007b) explains, attitudes are dynamic and can change over time. His research on wind energy attitudes shows a so-called U-shape development, where as soon as people are confronted with a technology their opinions turn, but alter positively again after an energy technology has been constructed. This U-turn effect could only be seen when environmental impact was adequately taken into account. This shows that public attitudes change with changing circumstances and conditions. We include this time element by looking at the different attitudes, actors and objects across different phases of RET implementation on the local level.

2.3 Methodology

2.3.1 Research design

This paper follows a qualitative research design. Empirical data were gathered through an in-depth case study analysis of wind- and solar projects in the Netherlands. To get a better understanding of the process of acceptance we chose wind and solar projects that can be classified as 'uncontested' and thus administratively successful. More specifically, we selected 8 irrevocably authorized and/or opera-

tional wind and solar projects in the Netherlands that were implemented without delay due to opposition. More specifically, the selection of cases was based on the absence of filed court proceedings towards the RET project proposal, as this is where delay due to opposition is most well-reflected. Above all, this selection of cases provides an important empirical counterbalance to the majority of acceptance research which mostly reports on cases that faced opposition resulting in delay or postponement of RET projects.

Dutch RET development processes are shaped by both formal and informal institutionalized processes. Formal institutionalized processes are the procedures that are legally part of the spatial development process on the local scale. These formal processes trigger many informal processes, like early informal consultations. Looking at these different processes, RET development can roughly be divided into four development phases: the preliminary phase, the permit phase, the construction phase, and the operational phase.

The preliminary phase is the phase before an official permit application is submitted. It is characterized by informal conversations between developers, authorities, experts, and, in some cases, residents. In this phase, the project develops from an idea to a concrete RET plan and design. This phase is informal as no official legal decisions are made. The permit phase, in contrast, is a formal phase where legal rules determine the terms and procedures. It starts when a permit application is submitted to the relevant authority and ends with a formal binding decision of approval. The construction phase starts when the appeal period expires and ends when construction finishes. Finally, the operational phase is the phase where the RET is operational and produces electricity. Table 2.1 shows the selected wind and solar projects, their location, development phase, size, business model, and number of interviewees. Among the uncontested cases developers identified either as cooperative (cooperation) or non-cooperative (private business) developers.

We took a project-focus lens to be able to analyze the complex processes of RET project implementation, the roles of different actor groups, and how responses came about. For each project, we asked interviewees about the different phases of RET project implementation. We specifically considered the different objects of acceptance on the local level, the actors that were involved, and how they engaged with the project and each other. We combined this process-oriented approach and looked for a range of responses, from passive (approval) responses to active (approval) responses (e.g., from silence to support). Table 2.2 shows how we operationalized the acceptance process of RET projects.

Table 2.1. Selected wind & and solar projects in The Netherlands

	Project	Development phase	Location (city and municipality) and characteristics	Size	Business-model/ set-up.	Number of interviewees
1	Solar park Kooypunt	Operational	Den Helder (Den Helder) – located in a business area.	15 ha	Non-cooperative	5
2	Solar park De Dogger II	Irrevocably authorized in 2018	Den Helder (Den Helder) – located between business and rural area.	5 ha	Non-cooperative	5
3	Solar park Molenwaard	Operational	Hoogezand (Midden-Groningen) – located in rural residential area.	35 ha	Non-cooperative	7
4	Wind park Spinder	Operational	Tilburg (Tilburg) – located between business and nature area.	4 turbines	Partially Cooperative	2
5	Wind park Heibloem	Operational	Heibloem (Leudal) – located in rural area.	2 turbines	Cooperative	3
6	Wind park Ferrum	Operational	IJmuiden (Velsen) – located in industrial area.	3 turbines	Non-cooperative	4
7	Solar park Zonnedorpen	Operational	't Zand (Loppersum) – located in a rural residential area.	0.085 ha	Cooperative	3
8	Solar park Heldair II	Irrevocably authorized in 2022	Den Helder (Den Helder) – located in a business area.	18 ha	Non-cooperative	3

Table 2.2. Framework for studying community acceptance as a process.

Phases of RET project implementation *(Time)*
Preliminary phase, Permit phase, Construction phase, and Operational phase.

Actors involved *(who)*	**Role of actors** *(how shaping)*	**Responses** *(how accepting)*	**Object of acceptance** (*what)*
Classified according to role in society following the conceptualization of Wüstenhagen et al. (2007): Local authorities Local stakeholders Local residents	Ranging from active or passive (in)formal shapers of the RET implementation process.	Responses ranging from passive (opinion + no expression of opinion) to active responses (opinion + forms of expression of that opinion) in the RET implementation process.	Aspects (and its characteristics) of the local RET implementation process.

2.3.2 Research methods

2.3.2.1 Data collection methods

This study makes use of qualitative data collection and analysis. In contrast to the often-used large-scale quantitative opinion polls, a qualitative method is more suitable for uncovering underlying dynamics that drive processes. In our process-oriented approach, using a qualitative method is particularly advantageous

because of its ability to uncover detailed lived experiences, meanings, and explanations of processes ascribed by different individuals (Creswell & Creswell, 2017).

We held thirty-two interviews with key stakeholders from the selected cases. Interview questions (see Appendix B) were developed based on the operationalization presented in Table 2.2. Stakeholders were identified according to Friedman's definition of stakeholders: relevant actor's affecting or being affected by decisions or actions (Reed et al., 2009). Snowball sampling was used to identify the first group of stakeholders. Special attention was given to an often-heard critique in the literature, namely that acceptance is often operationalized as either outspoken opposition or outspoken support, often neglecting that there is a silent middle group (Dermont et al., 2017; Stadelmann-Steffen & Dermont, 2021). This silent middle group, however, can act as an important influencer of the implementation process and was hence included. We did that by complementing the first group of stakeholders with stakeholders selected through a random selection of local residents. As we specifically focus on community acceptance, stakeholders were eventually classified according to the subjects of community acceptance identified by the literature, namely local residents, local authorities, and local stakeholders (Wolsink, 2010; Wüstenhagen et al., 2007). Table 2.3 shows the classification and amount of interviewees per actor group. The point of saturation was found at thirty-two semi-structured interviews.

Table 2.3. Categorization of interviewees of selected RET projects.

Actor group classification	Amount of interviewees
Authorities	6
Residents	16
Other stakeholders:	10:
Developers	6
Interest groups	4

2.3.2.2 Data analysis & interpretation methods

The transcribed interviews were analyzed following a two-coding-cycles approach. The first cycle consisted of process coding. Process coding helped us to identify emergent themes and discover similarities and differences across interviews (Saldaña, 2016). The second-cycle coding consisted of elaborative coding. In this cycle, we translated the emergent themes into the framework by, when possible, categorizing them according to the operators, deductively derived from the literature, in Table 2.2. Themes that did not fit the dimensions of the framework, were categorized independently. This elaborative coding was done to define and understand the main processes important for community acceptance and to reflect on the initiated analytical framework to study community acceptance.

2.4 Results

In this section, we describe the details of the acceptance processes over time, for the different phases of the RET project implementation. This helps us to tease out the changing roles of actors over time along with the varying responses and objects of acceptance. Quotes are illustrative of the observations unless defined as exemption.

2.4.1 Preliminary phase

Of all phases, actors' opportunities to shape and influence the project are the largest in this phase. At the same time, the role of actors is least defined in this phase. Further, we observe that the responses formed in this phase do not change much in later phases. These responses relate to the project as a whole and its spatial embedding and are much broader than just technology acceptance. Below we describe our results in more detail.

Among the uncontested cases, projects were both initiated by cooperative developers (three) and non-cooperative developers (five). In most instances (seven), there was an earlier attempt to develop the location, it was mentioned in policy documents as a suitable location, or it was an area with other (RET) developments. Both cooperative and non-cooperative developers were driven by perceived business opportunities. Notably, cooperative developers were distinguished by predefined social values guiding their activities, for example aiming to enhance financial inclusivity in the energy transition or benefit the local community.

> We had predefined criteria for development [...] for us it is important that a single mom should also be able to partake in the solar field. – cooperative developer

The developers took an active, initiating role. In most of the cases, the developer reached out to local authorities with the RET idea as soon as they eyed a location.

Interestingly, all local authorities, regardless of their response, took an active and facilitating role as soon as the RET idea was communicated. This role encompassed checking internal political support as well as consulting internal and external experts about policy and spatial rules and requirements, and weighing their advice. This process was slower for hesitant authorities, often requiring additional participation and stricter rule interpretation. Consultation processes between developers and municipalities were most frequent in the preliminary phase.

Residents were involved once the RET project was considered feasible by experts and authorities. Overall, residents were either passively involved or actively influencing the RET process. Residents had three roles: inaction (by being notified, listening, or joining info evenings), shaping spatial integration (by giving opinions/

thinking along during info or consultation sessions or responding to feedback forms), or taking an active role regarding benefits distribution (by setting up distribution community benefits).

For both authorities and residents, we see that roles and responses are dynamically related. The responses of local authorities' responses ranged from hesitant or rather positive. Hesitant responses were often attributed to upcoming elections or local authority's lack of expertise with RET development processes.

> When they [developer] first came in, our alderman considered it [RET] very sensitive, but that also had to do with the fact that the elections were coming up. – local authority

In contrast, favorable responses stemmed from alignment with municipal environmental visions and policy or failed previous development attempts while there were existing development aspirations.

The responses of local authorities stayed positive or grew more positive after observing implemented requirements, advice, and design and spatial adjustments. Moreover, good cooperation in the preliminary consultation and formation of trust was important for enduring positive responses from local authorities over time.

> Although in theory, it should not matter if you have to deal with person A, B, or C, it does matter what type of people you have. And with this developer there was just mutual trust and good consultation. – local authority

Three types of resident responses were identified upon notification about the RET plan: disliking, not minding, and being fine with RET plans. Notably, 'being fine' was the most robust positive response. Responses were not only related to the RE technology, but also to other aspects of the RET project (e.g., location, spatial integration, process) and stemmed from health concerns, (dis)trust in the developer, spatial fit, impact compared to previous plans, personal interests, and understanding the urgent need for green energy.

> I do not like it. That's very simple [...] we understand that there should be solar parks, but rather not in my backyard, so to speak. – resident

> From the beginning onwards, I was fine with solar panels instead of the original housing plans. – resident

> Initially, I was fine with it because at that time it was not yet known that there would be a supply freeze. – resident

Interestingly, residents sometimes refrained from expressing their opinion, hence both passive and active responses were present, ranging from a silent opinion to joining information evenings or actively expressing opinion in consultation sessions. In the majority of the cases, residents sensed the RET plan was predetermined before being notified. People refrained from voicing opinions and chose a passive role when they trusted the RET plan development or believed their influence towards one or more aspects to be negligible. Hence, inaction did not always imply acceptance.

> In terms of decision making, I mostly went along with what people who did go to those meetings told me. I never delved into the possibility of objecting or whatever. I thought it was fine. – resident

> We were informed via an invitation letter [...] of course you could go to an info evening, but we often know how it works: you can go and protest, you can say we don't want that, but it is pushed through anyway. – resident

In only two cases people were invited to think along with spatial plan integration. Reasons for taking this opportunity, and thus taking an active role, were mainly the desire for influence despite the thought that the RET plan would go through either way. Reasons for choosing a passive role and not joining the consultation opportunity ranged from trusting others to considering their interests, or time constraints.

> I thought this RET idea is really compromising my view, but if it is going through anyway, I want to see if I can get it to my liking. – resident

In two cases residents consciously took a more active role than the one assigned to them by developers: they set up a community fund for distribution of benefits.

> We have established a neighborhood cooperative so that we can keep everyone informed about the developments that take place and also about the finances and so on so that they cannot play us against each other. – resident

Results indicate that residents' active or passive responses are influenced either by a lack of reservations or perceived roles. We observed a reciprocal influence between residents' responses and their perceived roles. It became evident that authorities' responses shaped the intensity of their role, whereas their (perceived) role does not seem to significantly impact their response patterns.

2.4.2 Permit phase

In this phase, opportunities to shape the project were reduced to yes/no aspects of the overall project. Formal rules for participation reduced actors' influence scale and scope.

In the permit phase actor roles adhere mostly to formal institutional rules. In all cases, developers formally applied for RET permits after receiving authorities' and experts' informal feasibility confirmation. Depending on existing policies, developers had to demonstrate public support or engagement by reporting on information and consultation sessions. Overall resident involvement decreased compared to the preliminary phase.

The role of the authorities changed from facilitator to formal permit assessor and licensor in this phase.

> During the preliminary process you are more coordinating [...] during the application phase you are, of course, the competent authority. – local authority

Authorities must assess permits within a set period, during which stakeholders can formally express complaints (formal views) and thus, can have a more formal role. Authorities have the responsibility to check these views and respond to them. In all cases where formal views were filed, authorities declared them invalid as RET plans met feasibility requirements and were perceived, seeing the small number of filed views, as being in the public interest.

For residents a shift in access to roles could be observed, encompassing: inaction, filing formal views, and filing court procedures. Inaction correlated with a passive approval response, driven by being okay with at least one or more aspects of the RET project (location, design in general, and openness of developer), or not wanting to struggle against the majority or resource limitations concerning the complex bureaucratic processes of filing complaints.

> You can indeed object [...] but I did not do that because I am fine with it. – resident

> Of course, you can object. But let's be very honest, it is like with an election, if 100 people object and 200 do not, then it stops anyway. [...] you can nag about that, but that is just the way it works. That's democracy, isn't it? – resident

> I also just think that most people, [...] are kind of meek sheep anyway and just accept a lot of things. And especially, of course, because it is often difficult to be able to do something against bureaucracy [...]. – resident

In two cases stakeholders and residents did make use of a more formal role by filing formal complaints. Reasons for filing views were: developers' refusal to compromise on RET plan adjustments, missing public interest considerations in authorities' RET approval, and wanting to make a formal statement about the reasons for their opinion.

While no cases led to court proceedings, considerations for filing for court were present. Considering court proceedings is a careful process of weighing different arguments and chances of success. The main arguments for stakeholders not to file court proceedings, were limited person power, limited time, and only partial objections to the RET implementation.

Despite formal roles, residents wielded the most shaping power in the preliminary phase. Formal roles mainly allowed yes/no decisions, with limited room to negotiate on sub-aspects, as the content of formal views is weighed against practical feasibility requirements. Furthermore, residents' responses remained heterogeneous towards different aspects and remained unchanged towards the next phase (except in the case of changed circumstances, which altered some responses either positively or negatively). Particularly, passive responses related to perceived disempowerment in the preliminary phase shined through passive responses and roles in the permit phase.

2.4.3 Construction phase

The developer's role shifted towards a business role once the permit was officially granted. Primarily, they negotiated with contractors and aligned construction planning with authorities. In rare cases, they continued to address resident complaints about construction nuisance.

During construction, authorities' role turned informal again and primarily comprised: monitoring the RET construction and supervising whether all requirements were being met. They, thus, kept a facilitative role towards the developer and a supervising role towards the RET project construction.

While residents' and stakeholders' roles decreased, their responses remained present in this phase and were twofold: liking or disliking different objects during the construction phase. Displeasure with construction noise is the most common. Most residents did not further express this, except for some towards the developer. Furthermore, two other responses were expressed concerning the process of the RET project: like and dislike. A continuous information flow throughout the RET development phases was the main reason for being fine with the process.

> When they were constructing it I did experience some inconvenience, but well you have to take that for granted because there has to be the construction of course. – resident

> During construction, we did not experience any inconvenience. Besides, there has been some information there as well. – resident

Disliking the process, on the other hand, stemmed from the developer failing to keep residents informed (about the building phase and/or about process phases in general). Interestingly, residents did neither express nor act on this dislike response towards the developer.

> I would at least have liked to have been informed on how far the plans were, how far along the plan is when they are going to start [...] I don't need to get more involved but to be kept informed a bit [...]. – resident

In two cases residents and other stakeholders regretted not filing complaints after acquiring new information that could bolster their case.

> A week later we received a ruling [in our favor] from the State Council on a wind turbine [...] if we had known that a week earlier, the coin would probably have fallen the other way. – stakeholder

2.4.4 Operational phase

Once the RET was operational, the developers' role remained small and entailed RET maintenance, revenue collection, and sometimes revenue distribution. In three cases, residents were somewhat involved in or because of the revenue distribution, either through a community fund for community benefits or through cheaper energy for local members of the cooperation. In the cases of revenue distribution through a community fund, residents were involved in decisions about how redistributed money for future community projects is spent. With revenue distribution via cheaper energy, the cooperation's memberships increased, making residents shape possibilities of the cooperation's future energy transition endeavors. Interestingly, revenue distribution through a community fund was both present with a cooperative and non-cooperative developer. In cases without revenue distribution, the developer did not involve residents any further after the construction phase and mostly passive roles could be observed.

Residents' post-realization responses remained similar to those during the RET development. Their responses differ towards different aspects of the RET development process. On the one hand, residents did not mind the RET or its aspects. Reasons for lack of reservations towards RET or its aspects range from: being fine

with RET from the beginning, because of the spatial integration (meeting expectations/getting used to it), experiencing the process as transparent or feeling the ability to show influence, or approving of the distribution of benefits. In that regard, their role in earlier development phases can shine through their responses in the operational phase.

> I think they did very fine in terms of the height of the park [...] this is really very neatly done I think. – resident

On the other hand, some residents showed reservations towards RET, or its aspects, after realization. Reasons ranged from: disliking the maintenance or the spatial integration (location and way of integration), increased health worries, feeling poorly informed (so not necessarily because of not having influence), dissatisfaction with the distributional outcome, or increased worries about future developments after receiving new information.

> The only downside is that they [developer] made a promise that there would be bushes around it, [...] they put plants in there [...] but that did not have any water [...] so yes, that as such is a bit of a failure. [...] No, yes, that's actually a bit sloppy, that could have been done better. – resident

> Well, I was just a little less enthusiastic about the RET being surrounded by a dike. Because with that, my view is just gone. – resident

> I am very easygoing with it, I find it all fine, as well the construction, I do not have a problem with that. But as I said, if you are promised more information, then they [developer] should provide that. – resident

Overall residents show few active (approval) responses and few active roles after realization. An exception is seen when a form of revenue distribution occurs.

2.5 Discussion

The results presented above demonstrate the interaction between the different dimensions of acceptance (who, what, how) over time. Throughout the discussion, we address the process of acceptance by zooming in on these dimensions and their interaction. We see that the process of acceptance goes beyond resident acceptance alone, that acceptance comes about rather through a weighing process than a fulfilled checklist, and that roles can influence and interact with responses dynamically.

2.5.1 Community acceptance going beyond citizen acceptance

First of all, empirical results reveal that the process of acceptance comes about by interaction of multiple actors. Authorities, residents, and other stakeholders define the acceptance process and need to be engaged to achieve acceptance. Especially in the beginning, municipal support is crucial for a successful RET implementation process, making them gatekeepers for acceptance. Community acceptance, thus, goes beyond citizen acceptance alone. While research often stresses the importance of deliberative citizen involvement for acceptance (Gross, 2007), this focus on citizens alone misses nuance. In fact, actor involvement is a highly dynamic process for which everybody has to be on board to a certain extent to make it work. This also shows that the idea that acceptance is something controllable and something to steer is short-sighted in its focus on citizens alone.

2.5.2 Varying objects of acceptance within the RET implementation process

These multiple actors respond to various objects that they consider important for acceptance. We could distinguish seven objects actors responded to in their consideration of acceptance: the location, the RE technology, the spatial integration, the process, the construction, the distribution of benefits, and the indirect effects and aspects of RET implementation. These objects of acceptance emerged throughout the different phases of the implementation process.

Prior research confirms differences in acceptance objects across RET- decision-making scales (e.g., RE in general or locally installed RE technologies)(Perlaviciute & Squintani, 2020; Wüstenhagen et al., 2007). Our results disclose that acceptance objects also differ within one decision-making scale (in our case the RET implementation process), as actors' responses relate to different aspects of the RET implementation rather than the RET implementation in general. What is more, while we still do not fully understand the feedback loops between community acceptance processes and other facets of social acceptance (socio-political/ market acceptance), we see that not only implementation-related aspects but also more general aspects are acceptance objects in the community acceptance process. This also hints toward Wolsink's (2018) argument that the different tenets of social acceptance shine through/inform each other and that local acceptance is embedded in broader societal concerns (Batel, 2020).

Besides, these objects showed a great variety of characteristics. We see differences between cases regarding characteristics of the location (rural vs. industrial), type of RE technology (wind vs. solar), spatial integration (visible vs. not visible after integration), process (participatory vs. not participatory), and distribution of benefits (present vs. not present). What stood out, was that solar parks did not significantly face different responses than wind parks. Interestingly, unpacking these different objects and their diverse characteristics, shows that technology is only

one of many aspects that individuals consider important for acceptance. This nuances the notion of RET acceptance as such.

2.5.3 Varying responses of acceptance within and across actor groups

There is a variety of underlying discourses underpinning responses. Authorities show different responses ranging from hesitancy towards support when they first hear about the RET project. Also, residents responded heterogeneously towards different aspects of RET implementation (e.g., not minding the spatial integration, but minding the lack of information provision) or even towards the same aspects (e.g., one actor not minding lack of participation, another disagreeing with the process).

This corresponds with research on underlying reasons for opposition and proposition towards RET implementation, which highlights that responses within actor groups are hardly uniform (Ellis et al., 2007) and there is a multiplicity of complex and nuanced arguments within this dichotomy (Petrova, 2013). The nuance that we see is however, that apart from the variety of underlying discourses for approval responses, these responses also again relate to different aspects of RET implementation rather than RET implementation in general.

2.5.4 Actors weighing responses over time

Similar to what Windermer (2023) found in the context of wind energy implementation, we see that actors' responses towards wind- and solar energy implementation do not change much over time, contrasting common U-shape expectations that acceptance will increase over time (Wolsink, 2007b). Instead, we see that responses relate to accepting one aspect over the other (e.g., not liking the visibility of RET, but accepting the process). As different objects of acceptance emerge over time, responses seem to be formed through a process of evaluating and weighing various aspects in relation to each other. This goes beyond the idea, often encountered in policy, that responses are formed by statically adhering to a universal checklist of criteria influencing acceptance. For example, authorities' responses are based on weighing the extent to which objects and their characteristics fulfill political and practical requirements over time. For residents we could see that responses are based on a similar weighing process between objects and their characteristics, but also on the role the residents *can* and *want to* take in the implementation process. For residents we could, thus, see that their response frame is informed by their estimation of the role they can play.

2.5.5 Varying roles shaping aspects of RET implementation

We observed actors taking different roles in the process. For authorities, in the beginning, this role is less defined by institutional structures but becomes more formal over time. The degree of the facilitating, and proactive, role they take in the

preliminary phase is largely motivated by the political climate and expertise within the institution.

For residents, we observed that their role is less formal and their chance of shaping the process is highest in the preliminary phase. We saw a broader range of three roles by how residents can influence the outcomes of local RET implementation. Firstly, results show that residents can have a rather passive but influential role towards RET acceptance by inaction (this can include reading about it, being informed, and even joining info evenings). Inaction is mostly interpreted as acceptance and, thus, encourages authorities to approve developing RET. Observably, residents often consciously choose to not take an active role, either because of the lack of reservations (so emerging from a positive response) or due to disempowerment (time constraints, or feeling of having no influence anyway) to shaping the project (or aspects of it) towards acceptance. For residents this shows that roles, and the influence that comes with these roles, can define actors' response frames.

While residents are often in more passive roles, two other roles emerged. In some cases, residents were able to think along and, thus, were offered a more active shaping role regarding the spatial integration of the RET. In this case, shaping possibility is limited to a certain aspect, the spatial integration, of a RET project. Finally, in some cases, residents consciously adopted a more (pro) active role towards RET aspects, regardless of assigned roles from top-down procedures. Exemplary of this active role are some residents who shaped the outcome by influencing the distribution of benefits, which increased their acceptance of this object. Although (the taking of) roles appear to come about by the way procedures are shaped, they are not the exclusive determining factor. In addition to established roles, we observed the emergence of new roles, such as an active role in the distribution of benefits, which operated outside of established procedures (and not necessarily as a reaction to poorly implemented or deficient procedures). This illustrates that responses can also trigger the adoption of more active roles. Therefore, it is evident that roles and responses are dynamically interconnected.

We observed that actors' roles can serve as indicators of increased acceptance towards one aspect, without necessarily implying approval of other elements. For example, residents being offered an active role in the process considered the process more tolerable, and residents involved in the distribution of benefits considered the distribution of benefits more acceptable. Consequently, we observed that residents' acceptance of one aspect improved while disapproval of other aspects remained. Interestingly, the acceptance of some aspects, despite the remaining disapproval of others, seemed suffice to increase the overall acceptance of RET. A positive response towards one aspect did in that regard influence the overall judgement of the RET implementation. As a result, accepting at least one object

can significantly influence overall RET acceptance, indicating that people are sometimes willing to make concessions for the common good. In this, roles can enhance acceptance, but they are not the sole determining factors for overall acceptance. Instead, roles and responses interact dynamically and have the potential to increase acceptance of objects while not necessarily leading to approval of all.

2.5.6 Navigating nuanced participation in the process of acceptance

The literature frequently highlights the connection between roles and acceptance by emphasizing the importance of inclusive and deliberative resident participation for acceptance (Gross, 2007; Wolsink, 2007a), not only regarding the process but also regarding the distribution of benefits (Cowell et al., 2011). We observe that in literature this call for inclusivity is often defined in terms of the number of people being (en-)able(d) to join a certain deliberative participatory format.

Our data reveals varying preferences in actor participation during the RET implementation process. We observe that inclusivity is not only reached by uniform participation but rather by offering different formats that target the different preferences of these heterogeneous actor groups. For example, those not seeking a bigger role, still desire inclusion through information regardless of their already positive response. Besides, inclusivity should span different participation formats throughout time, targeting different aspects actors want to shape. For example, actors accepted the object 'process' without desiring a bigger role, but still wanted to influence revenue distribution. This underscores that actors' desire for participation can vary over time and that actors do not necessarily want to be constantly engaged in the same way.

This aligns with research showing different participation preferences over time instead of optimum formats (Kluskens et al., 2019; Langer et al., 2017). To achieve inclusivity, participatory processes need to adapt to nuanced actor needs. Consequently, interventions should be targeted at enabling more nuanced participation formats, rather than changing opinions of actors overall. This is in line with recent work on participation which criticizes mainstream participation approaches for being too rigid, pregiven, and decontextualized (Chilvers et al., 2018). Hereby, participation should not be a tool to steer people, but it should rather empower them to access the whole response frame regarding objects of their choice, and thereby enhance overall acceptance.

2.6 Conclusion

Our study revealed the dynamics of acceptance within the context of RET implementation. We have explored the interaction between various dimensions of acceptance over time.

First, our research demonstrates that acceptance is a multifaceted process involving multiple actors, including residents, authorities, and other stakeholders. Community acceptance goes beyond citizen acceptance alone and authorities are crucial stakeholders for community acceptance and further development of RET. We thereby challenge the notion that acceptance is solely related to citizen involvement and show that the sum of individual, and rather heterogenous, approval responses by a variety of stakeholders can shape the overall acceptance outcome of RET implementation.

Second, by differentiating between actors, objects of acceptance, roles, and responses we found that even in uncontested cases, actors still disapprove of some aspects of the RET project. Accepting RET implementation seems to mean accepting certain, and not necessarily all, aspects of the RET implementation, ranging from the location to the process and distribution of benefits. By empirically differentiating between the different objects, we see how acceptance of one or more aspects can echo acceptance over the full RET project. Hence, even in the unproblematic cases acceptance is ambiguous.

Third, looking into the development of responses over time highlights the great diversity of responses towards different aspects of the RET implementation process. This variety of responses goes beyond the understanding of acceptance as a unanimity of positive responses to RET implementation in general, but shows responses are pluriform towards different aspects of an acceptance process. Furthermore, we show that individual responses as such do not change much throughout the RET implementation process. Instead, responses relate to different aspects of the RET implementation process and are formed by weighing one aspect against another. Diverse objects are being evaluated in relation to each other, making it rather a continuous negotiation and weighing process, than a static universal checklist of factors that have to be met for approval of RET aspects. Instead of focusing on factors influencing actors' responses, we show that acceptance is a dynamic process, where different objects and actor roles are evaluated in relation to each other.

Lastly, unpacking the different roles of actors in the RET implementation process highlights the various formal and informal roles of individuals throughout the RET implementation process. Overall we see that residents have more chances to influence the RET implementation in the preliminary phase regardless of their formal given role in the permit phase. Interestingly, roles do not necessarily only come about by (a reaction to) (in)formal existing procedures; we observed the emergence of roles outside those procedures and being dynamically interlinked with responses (also showing actors taking agency outside existing procedures). Additionally, we see that residents prefer different forms of involvement regarding

different aspects of RET implementation. Actors' heterogeneous desires to shape different aspects of RET implementation calls for more individualistic rather than generalistic engagement approaches.

Important to note is that participation (roles and influence) can, but is not the only factor for acceptance. We rather see that perceived roles can influence people's response frame, and that preferences for roles vary within actor groups. Besides, these shaping preferences relate to different aspects and can thus influence how actors see certain aspects of the RET implementation. Even in cases that seem unproblematic, there is still room for improvement in the process, given the preference for diverse involvement possibilities. It is evident that this heterogeneity of preferences over time is not adequately facilitated through current procedures. For example, even in the cases where people do not mind the RET or cannot take up a more active role in the process, it does not mean that they want to feel excluded by lack of information throughout the process. Rather than normatively addressing the best ways for involving residents, it emphasizes the need for a participatory process tailored to the unique preferences of different stakeholders regarding various aspects of RET implementation over time. This means offering a range of shaping options to cater to the diverse preferences of various actor groups.

Our research shows that acceptance is a multifaceted concept. By highlighting the temporally dynamic nature of acceptance, we show a different understanding of acceptance itself. This understanding consists of an interaction between different dimensions, namely: actors (who), roles, objects (what), and responses (how). This differentiation challenges the notion of acceptance as a one-dimensional construct. Our empirical focus on uncontested cases shows that divergence exists between how acceptance is understood as an outcome, and as a process.

This understanding of acceptance as a dynamic process moves away from the 'checking the box' and outcome-oriented approach we often encounter in research and policy. Such a one-size-fits-all approach, where acceptance is to be met by meeting universal criteria, does not do justice to the nuances of acceptance processes. Evidently, by moving away from a purely outcome-oriented focus, acceptance of the energy transition becomes not merely an intended outcome but instead widely embraced by all actors involved.

With this research, we moved away from the normative top-down research perspective on how people relate and respond to energy technologies, related infrastructures, and changing social practices. By complementing scholarly insights with empirical insights this research adds to a more comprehensive and nuanced understanding of acceptance of energy transitions and RET. To further deepen understanding of the acceptance process, there is a clear need to further unpack

the factors and conditions that impact actors' acceptance of particular elements of RET implementation, with a focus on understanding the threshold, and the dynamics around it, at which acceptance of one object can lead to overall RET acceptance. This would also give a better understanding of how actors weigh their responses towards different objects over time and the specific effect of various roles in this dynamic. These research lines can further facilitate the call for a more critical and dynamic approach to acceptance as a process.

Eindnoten

3. See Appendix C.

Chapter 3

Energy Citizenship

This chapter is based on Kluskens et al., (2025)

Abstract
The role of citizens is increasingly recognized as crucial in the socio-technical transformation of energy systems. This paper examines the concept of energy citizenship (EC), which associates the evolving roles of citizens as active participants in low carbon energy transitions.

Despite the growing body of literature, the concept of EC is often approached through a narrow empirical lens, focusing mostly on certain aspects of energy transitions (e.g., entrepreneurial acts, citizens alone), thereby disregarding others. This limited focus risks framing EC as a status rather than a practice in the making, reinforcing assumptions that EC is reserved for the able and the willing. Such framing restricts our understanding of how and why citizens assume roles in energy transitions, and obscures understanding of the processes, frictions and structural conditions that shape the enactment of energy citizenship.

In this research we examine EC beyond the usual empirical settings by focusing on temporal, multiple actors, centralized and non-entrepreneurial contexts. Through a case study of multiple neighborhood heating initiatives in socio-economically disadvantaged areas in the Netherlands, we explore how different empirical settings can inform a processual understanding of energy citizenship. Our findings demonstrate that energy citizenship can be understood as a dynamic, embedded, cross-actor and fluid phenomenon.

By broadening the analytical understanding of EC, this study offers more comprehensive insights in the limits and opportunities of EC enactments in energy transitions. It also offers actionable insights for policy makers aiming to foster more inclusive and equitable energy systems.

3.1 Introduction

To mitigate the challenges posed by climate change, societies across the globe, and Europe more specifically, have committed themselves to a socio-technical transformation of the energy system (United Nations, 2015). This low-carbon energy transition not only requires an assembly of new technologies, but also social practices, institutions, and meanings that ask for and facilitate the emergence of new roles and responsibilities of actors (Lennon et al., 2020). In this process toward a low-carbon energy system, it is especially the role of citizens that has gained significant recognition in both literature and policy (Rijksoverheid, 2019; Schot et al., 2016).

In the energy context citizens were, until recently, mainly conceptualized as passive consumers (Ryghaug et al., 2018) and the relevance of their role was mainly addressed against the instrumental backdrop of generating public acceptance (Wahlund & Palm, 2022). Citizens are increasingly acknowledged as vital stakeholders and active agents in accelerating the transition toward cleaner, more just, and more sustainable energy systems (Devine-Wright, 2007a). This change and proposition of citizens as active stakeholders in the evolution of the energy system is encapsulated in the concept of *energy citizenship* (EC), which is generally associated with roles and role uptake of citizens.

Energy citizenship discourse broadens the view on the role of citizens in the energy system and facilitates new ideas on and acknowledges rights and responsibilities that come with these roles (Beauchampet & Walsh, 2021; Pel et al., 2022), referring to the idea that citizens' roles can be substantial (Wahlund & Palm, 2022). While there is a growing body of research on energy citizenship, the concept faces some challenges when it comes to conceptualization and operationalization (Pel et al., 2022; Silvast & Valkenburg, 2023). One of the critiques is that the concept stays rather unspecific and builds on normative ideals of people *wanting* and *being able to/be good citizens if they* take up certain roles and responsibilities in energy transitions (Lennon et al., 2020).

These idealized new roles and responsibilities are actively reflected and facilitated in European energy policies (e.g., motivating uptake of individual RE technologies or facilitating energy communities) (Directive 2018/2001, 2018). In academic discussions, the concept of energy citizenship is criticized for predominantly mirroring neoliberal, and rather entrepreneurial, discourses on the everyday relationship of citizens with the energy system (Lennon et al., 2020). Also in the policy domain, there is growing recognition that citizens might not equally be able to access or carry the burden of certain foreseen roles and responsibilities in energy systems evolution (European Commission, 2019).

While more is known about the different roles citizens can assume in energy transitions (e.g., prosumer, policy maker, and activist (Chilvers & Longhurst, 2016; Laakso et al., 2023)), energy citizenship is largely approached through a narrow empirical lens. Studies on energy citizenship often focus on citizens in isolation, overlooking the embedded nature of citizenship. Additionally, much of the literature rarely delves into the temporal aspect of energy citizenship and the processes that shape it. This is complicated further by a predominant empirical emphasis on decentralized or individual contexts in energy transitions (e.g., consumers investing in PV, or energy communities becoming prosumers), and related entrepreneurial roles of citizens. While the literature suggests that citizens are equally significant in energy transitions, a gap remains in the energy citizenship literature to conceptualize citizenship from more collective and non-entrepreneurial angles. The risk of this narrow empirical emphasis is that energy citizenship is portrayed or understood as a status (something individuals either *possess* or *achieve*), rather than as a practice in the making (what *makes* EC).

This raises two key concerns. Theoretically, this framing limits our understanding of how and why people assume particular roles in energy transitions. As a result, we still know little about the processes, frictions and structural conditions that shape the enactment of energy citizenship. This limits our ability to identify the potential barriers and opportunities citizens encounter in terms of taking up roles or responsibilities, and hampers to catch the reality of how citizens relate to energy transitions. Societally, a status, or idealized idea of energy citizenship reinforces the assumption that citizens can and will take up energy related roles if opportunities arise. This perspective overshadows lived realities of structural inequality that may prevent some groups, especially in more vulnerable settings, from engaging with or enjoying the potentials of energy citizenship. Moreover, by predominantly valorizing certain forms of citizenship (e.g., entrepreneurial prosumerism) other, less visible forms may be overshadowed or devalued. This not only reinforces existing exclusions, but also risks strengthening citizenship in one domain at the expense of empowerment in others. As a result, it can narrow the scope of what is recognized as legitimate participation, potentially turning energy citizenship into an exclusive endeavor.

Against this background, this paper aims to explore a more comprehensive and processual understanding of energy citizenship by studying why individuals assume specific roles and responsibilities in the energy transition context. To do so, we shift the empirical focus away from decentralized and individual contexts towards a publicly-led collective approach to energy transitions: specifically, district heating initiatives in The Netherlands. By zooming in on Dutch district heating endeavors, we gain insight into energy citizenship in more collective energy transition approaches, which go beyond singularized efforts of one household.

Moreover, we particularly include district heating projects in socio-economic disadvantaged neighborhoods. With this, we shed light on the evolution of energy citizenship paradigms in settings where entrepreneurial opportunities may be scarce, thus diverging from the prevalent entrepreneurial focus often overrepresented in EC discourse. Focusing on collective, publicly- led Dutch heat transitions and disadvantaged neighborhoods, and examining the roles of various actors over time informs and enables a more comprehensive and inclusive understanding of EC that accounts for lived realities and shows processes, frictions and structural conditions shaping citizen roles in energy transitions.

The question guiding this research is: How and why do citizens assume particular roles in energy transitions and how do these enactments inform a more comprehensive understanding of energy citizenship in heat transitions?

The structure of this research is as follows: Chapter 3.2 gives the theoretical context, outlining the development and current debates surrounding the concept of EC and positioning our analytical lens. Chapter 3.3 describes the methodological approach, including case study design and data collection methods. Chapter 3.4 presents the empirical findings, after which Chapter 3.5 offers a discussion. Chapter 3.6 concludes with reflections on the implications of our results and for future research and policy.

3.2 Theoretical context

Traditionally, citizenship refers to both a legal and everyday relationship between citizens and the state, encompassing among others ideas on rights and responsibilities. More recent debates in anthropology call for a more dynamic and fluid view on citizenship (Isin & Turner, 2007) as struggles over rights and responsibilities do emerge in new sites beyond the context of only the nation state (Isin & Turner, 2007). This redefinition is particularly relevant in energy transition contexts, where energy citizenship is increasingly conceptualized in expansive, broader social membership, contexts.

Energy citizenship gained prominence through Devine-Wright (2007a) who reframed the understanding of citizens in energy transitions to "the public are conceived as active rather than passive stakeholders in energy system evolution and where the potential for action is framed by ideas of equitable rights and responsibilities across society for dealing with the consequences of energy consumption, notably climate change"(Devine-Wright, 2007a, p. 71). Since then, the concept has traveled in many directions, from normative to more descriptive definitions.

Scholars acknowledge the concept's potential to further theorize the role of citizens in energy transitions (Wahlund & Palm, 2022) and understanding how 'indi-

viduals relate to the collective of which they are part' (Silvast & Valkenburg, 2023, p. 1), they warn that the concept's full potential is being threatened as it risks staying undertheorized and leaning towards what ought to be, rather than showing the deeper structural inequalities that define that relationship (Lennon et al., 2020). While we agree with Pel et al. (2022) that disregarding the concept would be premature, we identify four dominant aspects in the literature that energy citizenship is associated with (due to its narrow empirical application), which might hamper the potential understanding of citizens' roles and responsibilities in energy transitions. Below we briefly sketch the background of how these aspects come to the fore, thereby showing the dominant associations of EC in current academic discourse.

3.2.1 EC as an entrepreneurial endeavor

As Lennon et al. (2020) argue, much of the current research on energy transitions and EC remains grounded in conceptualizing energy as a commodity. Consequently, the idea of energy citizenship predominantly reflects a neoliberal discourse that frames citizens' roles in energy transitions through their economic choices within the energy system. This focus strongly emphasizes entrepreneurial forms of energy citizenship, where the role of citizens is embedded in "correct" consumer behavior (e.g., investing in PV, or an energy community). What complicates or restricts the conceptualization of energy citizenship beyond these entrepreneurial boundaries is the current organization of contemporary energy systems (Lennon et al., 2020), where energy is indeed treated as a commodity. Although this limited framing has faced criticism, the substantial integration of non-entrepreneurial dimensions of energy citizenship remains scarce and EC continues to be associated with and applied to entrepreneurial acts. Efforts by DellaValle & Czako (2022) to understand and advance energy citizenship, particularly in marginalized contexts (e.g., energy poverty), offer insights on how individuals might be empowered as consumers to attain forms of energy citizenship. However, as scholarship on cross-border citizenship and social workers has shown, when citizenship rights and equality become subordinated to economic rationalities, this not only narrows the scope of inclusion but also constraints the political space in which issues of access and exclusion can be raised (Dominelli, 2014). Similar dynamics can be observed in the domain of energy citizenship, where neoliberal framings risk legitimizing restricted forms of participation and belonging at costs of empowerment in public and institutional spheres (Nguyen & Batel, 2024), thereby overlooking structural inequalities embedded in energy systems.

3.2.2 EC as a decentralized endeavor

Additionally, a notable focus on energy citizenship has emerged within the context of increasingly decentralized energy systems (Wahlund & Palm, 2022). While this decentralized approach to renewable energy systems is logical given the nature of

renewable energy sources, it may narrow our understanding of energy citizenship by predominantly focusing on (small-scale) decentralized approaches to energy systems. Silvast & Valkenburg (2023), however, offer a different view by demonstrating that energy citizenship is also discussed at various scales, where entire energy systems serve as units of analysis rather than solely sub-aspects of decentralized approaches (see e.g., Beauchampet & Walsh (2021) who examine full energy systems as a unit of analysis). Nonetheless, we observe it often contains an analysis of the entire "supply chain" associated with shifting towards decentralized energy systems, for example individual heat transition endeavors from policy to implementation level. Yet, there remains limited attention to the transition towards more collective renewable energy systems, for example at a neighborhood scale, influencing that EC continues to be predominantly associated with decentralized energy approaches.

3.2.3 EC as a static endeavor

Amid these trends, there have been various attempts to further conceptualize citizens' roles in ongoing energy transitions. Wahlund and Palm (2022) note that energy citizenship can encompass both individual and collective actions in energy transitions. Others have highlighted the different acts that energy citizenship can entail, for example, usage behavior as a consumer, energy production as a prosumer, or participant in protest movements or policy-making (Fahy & Vadovics, 2025; Laakso et al., 2023; Schlindwein & Montalvo, 2023; Silvast & Valkenburg, 2023; Wahlund & Palm, 2022). There are thus multiple ways in which people 'experience, express and practice citizenship' in energy transitions (Rasch & Köhne, 2016, p. 2). Debourdeau et al. (2024) give a valuable typology of energy citizenship including dimensions of agency and outcome orientation of different classifications. While EC can thus be associated with diverse acts and expressions, many classifications portray EC as rather static than in the making. While Ryan, Hebdon, and Dafoe (2014) developed a way of understanding emerging citizenship, much research neglects critical forms of energy citizenship (such as resistance, disengagement, or protests), or how citizens move between certain roles, actions and motivations.

3.2.4 EC as an endeavor confined to citizens alone

Linked to this dominant static aspect is the association of EC as a citizen-alone-formation. Many classifications of EC as static acts, however, are shaped by what Chilvers and Kearnes (2020) describe as "residual realist" assumptions of the public, treating "the public" as a fixed entity rather than something continuously constructed. Consequently, there is a large focus on citizens and their actions, without considering the larger institutional and structural forces and related actors that influence citizens' roles. Nguyen and Batel (2024) illustrate how governance practices give rise to certain types of citizens and how EC discourse has been institutionalized, though only a few recognize EC being structured by governmentality

(Dunphy et al., 2024; Lennon & Dunphy, 2023; Teladia & van der Windt, 2024). Moreover, this citizen-alone framing mirrors a broader tension in citizenship studies: while citizenship has historically been rooted in ideals of universalism (equal rights and responsibilities for all) its lived experience is far more uneven. Across different times, places, and political regimes citizenship has been differentially accessible, and for many systemic inequalities continue to shape how citizenship is practiced (Dominelli, 2014).

Though EC seems to be a broad concept, in scholarly literature it is used in quite a restricted way, focusing mostly on and applied to certain aspects of energy transitions (e.g., entrepreneurial acts, citizens alone), thereby disregarding others. These dominant aspects have influenced what EC is associated with, thereby reinforcing the assumption that energy citizenship is a normative ideal and implicitly reserved for the able and the willing. To understand how the roles and responsibilities of citizens are shaped, we argue that the concept of energy citizenship could benefit from examining it beyond the usual dominant empirical settings. This includes examining EC in multiple contexts including temporal, multiple actors, centralized and non-entrepreneurial settings. By adopting a temporal lens, we explore how roles and responsibilities evolve over time, shaped by past experiences and future expectations. By focusing on multiple actors, we analyze how EC is co-constructed within complex institutional fields involving multiple actors like municipalities and housing corporations. Our focus on centralized contexts, like municipally-governed heat transitions at the neighborhood level, addresses a notable gap in literature, which often centers on decentralized systems. Finally, by examining non-entrepreneurial contexts, we explore roles and responsibilities beyond consumerist framings. By looking at citizens' roles and responsibilities from different empirical angles, we elaborate on a more comprehensive ('in the making') understanding of EC, one that possibly better reveals the processes and conditions under which EC enactments take shape.

3.3 Methodology

In this chapter we elaborate on the chosen research approach, the case study selection, data collection- and analysis.

3.3.1 Approach

To contribute to a more comprehensive understanding of EC in energy transitions, this study adopts a qualitative research design through a multiple-in-depth case study analysis. This approach enables a comprehensive examination of the sequence of individual and collective events, actions, and activities within their temporal contexts (Bryman, 2016). By selecting three district heat transition cases in the Netherlands, this study aims to grasp the contextual significance while facilitating comparison to identify overarching patterns of energy citizenship in

energy transitions. We specifically selected district heating cases to explore and broaden the empirical terrain where EC has been studied. Through this we could identify dimensions of EC which have till now been disregarded in EC discourse. Our case selection was guided by two criteria. Firstly, we focused on cases where the energy transition is being addressed on a publicly-led collective scale. More specifically, we included neighborhoods in the Netherlands where public authorities approach the shift to sustainable heating at the district level (=neighborhood level). Secondly, to move beyond the entrepreneurial focus in the literature and to better understand the structural factors shaping individuals' relationships and responsibilities within energy systems, we specifically included and concentrated on vulnerable neighborhoods in the Netherlands. To specify further, our focus was primarily on neighborhoods where more than 40% of the residents have the lowest income compared to the rest of the Netherlands, as this served as a direct contrast of the entrepreneurial focus commonly found in EC literature, where participation is often tied to financial capacity.

Since the concept of EC is not widely known or directly recognizable to most people (Fahy & Vadovics, 2025), we did not take EC itself as an analytical starting point. Instead, we adopted an inductive approach focusing on how roles and responsibilities around energy emerge in these contrasting contexts. From these observations, we analyzed how these role formation patterns can inform a more comprehensive understanding of EC. This abductive approach facilitated a more process-oriented and inclusive conceptualization of EC. Below we provide a description of the cases we studied.

3.3.2 Case description and characteristics

The cases included in this research are all pilots in the Gas-Free Neighborhoods Program (*Programma Aardgas Vrije Wijken, PAW*), now continued as the National Program for Local Heating Transition (*Nationaal Programma Lokale Warmtetransitie, NPLW*) (Rijkdienst voor Ondernemend Nederland, 2024). This program was initiated in the context of the necessary transition away from natural gas in the build environment. As Beauchampet and Walsh (2021) have described, this transition is embedded in broader goals related to climate change mitigation, international energy independence, and reducing damage caused by gas extraction in the Province of Groningen. Through the NLPW, the government supports local pilots financially with the aim to learn from pilots and draw lessons for the national heat transition. Municipalities have the freedom to determine their own approach, as the emphasis lies on exploring how a neighborhood-focused approach can be shaped and scaled. The pilots (neighborhoods) selected for this study are located in different municipalities in the Netherlands. These neighborhoods are characterized by diversified home ownership (housing corporations, landlords, and individuals), and can be classified as vulnerable neighborhoods in the sense of socio-econom-

ic capabilities and diversified problems. In their PAW application, all three cases outlined their intention to implement a publicly-led and collective neighborhood approach to the local heat transition. The pilots began in 2018 and are still ongoing. Table 3.1 gives more details about the case characteristics.

The selection of these PAW cases is theoretically significant, as the program represents a policy experiment in governing heat transitions at the neighborhood level. The neighborhood level was a scale assumed to foster both technical efficiencies and social innovation (Rijksoverheid, 2019). The 2019 Climate Agreement positioned neighborhoods as strategic sites for phasing out natural gas, based on expectation of cost savings (e.g., clustering similar housing types) and opportunities to address social issues like energy poverty or unemployment, fostering community participation and local democracy (Scholte et al., 2024). These policy aims, targeting the neighborhood scale while addressing broader issues such as poverty and citizen participation, make the case selection theoretically relevant. They reflect governance arrangements that operate at a collective level, where heat transitions are explicitly linked to social goals and where residents are expected to engage with (often predefined) trajectories. As such, these sites provide a meaningful context to examine what processes, tensions and structural conditions shape the emergence of EC.

Table 3.1. Selected cases and their characteristics

Cases of district heating projects[4]			
	Brunssum-Noord	Nijverheid	Pendrecht
Municipality	Brunssum	Hengelo	Rotterdam
Size of municipality	Small (27.770 inhabitants)	Middle (83.058 inhabitants)	Big (670.610 inhabitants)
Age of buildings	1960 - 1979	1945 - now	1945 - now
Types of houses	Flats and semi-detached family homes.	All kinds (apartments, single-family homes, etc.).	Mostly terraced houses and porch apartments.
Amount of households	858	2250	600
Homeownership	333	1125	Unknown
Amount of rental (social housing-private rental)	525	1125 (50-1075)	Unknown
Income level (neighborhood level)[5]	48,8% of residents belong to lowest income brackets in The Netherlands.	44,1% of residents belong to lowest income brackets in The Netherlands.	49,7% of residents belong to lowest income brackets in The Netherlands.

Image 1 and 2. Impression of neighborhood Brunssum-Noord[6]

Image 3 and 4. Impression neighborhood Nijverheid[7]

Image 5 and 6. Impression neighborhood Pendrecht[8]

3.3.3 Data collection

Our study uses both primary and secondary data. Primary data consisted of semi-structured interviews with stakeholders living or involved in the collective heat transition in the relevant neighborhoods. Stakeholders were defined based on people affecting or being affected by district heating endeavors in the selected neighborhoods. We looked beyond citizens alone to get a thorough understanding of the evolvement of roles and role uptake. After a first selection through purposeful sampling[9], further interviewees were identified through snowballing and random selection of stakeholders in the neighborhoods[10]. In total twenty-one stake-

holders were included in this research. Interviews lasted about sixty minutes and were following a topic guide (see Appendix D for the topic guide). Table 3.2 gives an overview of the amount of interviewees and their categorization. As stated earlier, we employed an inductive approach, allowing insights to emerge from the data rather than being shaped by predefined notions of energy citizenship. Our interview guide reflected this orientation, focusing on roles, actions, and decision-making responsibilities to explore how people relate to energy transitions in practice. Field notes about the collective heat transition in these neighborhoods were the second primary data source. Field notes were used to provide the further needed contextual information (Phillippi & Lauderdale, 2017), and consisted mostly about observations in the neighborhoods and reports about the door-to-door conversations. See images 1-6 for impressions of the included neighborhoods.

Secondary data consisted of official report documentation about the collective heat transition in the relevant neighborhoods. Secondary data was used to back up and deepen understanding of the processes and time scale in which these processes happened. Table 3.2 gives more detailed information about the primary and secondary data sources used in this study.

Table 3.2. Overview of primary and secondary data sources used in this study

	Cases	Number of interviewees (including door-to-door conversations)	Classification of stakeholders	Fieldnotes	Policy documents being included in analysis
1.	Brunssum-Noord	5	Municipality (1), Intermediate (1), Residents (1), Heat provider (1), Housing corporation (1).	Fieldnotes of observations of on-site visit	Project reports year 2019 & 2020
2.	Nijverheid	8	Municipality (1), Residents (5), Housing corporation (1), Intermediate (1).	Fieldnotes of observations of on-site visit	Project reports year 2019 & 2020
3.	Pendrecht	8	Intermediate (4), Residents (3), Housing corporation (1).	Fieldnotes of observations of on-site visit	Project reports year 2019 & 2020

Total amount of interviewees included: 21
*Intermediate = actor working in resident engagement
*Residents representing different socio-economic characteristics, like unemployment, chronic illness, elderly, single parent.

3.3.4 Data analysis

The data was analyzed using an inductive thematic approach. Initially, emerging themes were identified and classified through thematic analysis. Nvivo coding software supported the organization and identification of patterns across the data set. To ensure that the themes accurately represented the data, they were under constant reflection of the researchers, and were refined by nuancing, combining, or removing them, when necessary. These themes were then grouped into broad-

er categories that conveyed distinct narratives within the context of heat transitions. Sub-patterns within these themes were also identified to further unpack the complexity of citizen's roles and experiences. Our focus was exploring what these emerging themes revealed about energy citizenship in collective, non- entrepreneurial settings. For a more comprehensive view of the identified codes and categories, see the table in Appendix E.

3.4 Results

For this research we explored a more comprehensive understanding of EC by looking at different aspects of energy transitions beyond the ones currently represented in EC discourse. We examine how roles and responsibilities are formed and taken up by looking at multiple actors, over time, in non-entrepreneurial and collective contexts. With this we show that the concept of EC has more dimensions than those predominantly discussed in the literature. Our findings underpin the merit of understanding EC as a 3.4.1) dynamic 3.4.2) embedded 3.4.3) cross-actor and 3.4.4) fluid endeavor.

3.4.1 EC as a dynamic endeavor

While in the literature EC is predominantly associated with static roles and responsibilities of citizens in energy transitions, we show in this section that roles and role uptake are not static but rather change over time. These observations support an understanding of EC not as a stable status, but as a dynamic endeavor.

By looking at the context of the heat transition, data showed that roles and role uptake *change over time*. In particular, we observed that the changing roles of multiple (institutional) actors over time, influenced the roles and role uptake of citizens themselves. This dynamic became mostly visible through what we interpret as a "responsibility vacuum". Stakeholders often pointed to a lack of clear mandates or leadership, which hindered role uptake among other actors, including residents. This vacuum emerged from the foundational structure of Dutch heat transitions: heat transition goals have national and sometimes even local policy foundations, but they are not transformed into obligations, concrete (legal) rules on who has to do what and provide ample carrots and sticks to parties tasked with leading the transition (municipalities). As a result, municipalities faced role ambiguity, compounded by a lack of capacity, resources, and strategic direction (referred to by other actors as a lack of 'vision').

This role ambiguity for municipalities set the stage for two developments: a) task delegation to hired external parties and b) a growing need for collaboration with other local actors such as housing corporations, social workers, residents, or heat providers. While the roles and tasks for hired intermediaries were concretely formulated, in collaboration with other local actors roles remained more dynamic and

exploratory. As roles were not set in stone yet, this openness created space for multiple actors to explore and negotiate their roles in interaction. This allowed for shifts and adaptations over time, as roles evolved through trial and error experiences. For example, in two cases municipalities initially adopted an exploratory role, but later transitioned towards a more directive, coordinating role after the initial approach proved ineffective.

The evolving and often unclear roles of (institutional) actors over time also impacted citizen role uptake. Especially the continued ambiguity around the municipality's role, combined with lack of incentives and ongoing negotiations about responsibilities, left residents uncertain about what to expect. These factors resulted in unclear heating cost information influencing residents' willingness to commit or take up a role. This institutional uncertainty often translated into hesitation at the citizen level: in the absence of clear direction or ownership by other actors citizen role uptake frequently stalled. As a municipal civil servant explained, citizens stopped being engaged as a result of municipal inactions:

> But residents really wanted to know: "what are you going to do?". And we could not really give them the answer, because the council did not want to make a decision, the mayor and alderman did not want to make a decision, we did not know the costs...So at a certain point you run out of things to communicate to residents. – municipality

Beside roles evolving over time, we found that role uptake is also influenced by *considerations of time*. Exploring the heat transition in vulnerable neighborhoods showed that time is a crucial consideration for role uptake, especially considerations of what has more urgency: addressing immediate needs or long term solutions.

Intermediaries working in the neighborhoods expressed that in vulnerable contexts there is, more than in other contexts, an urgency for addressing immediate needs. While residents in these neighborhoods may need sustainable heat solutions more urgently than others, they often lacked capacity or willingness to engage. This was influenced by the perception that the heat transition is not addressing their most pressing needs, as they often fell outside the scope of heat transition efforts. As one intermediary explained about this time dilemma for residents:

> And it remains, of course, the dilemma here: how far should you push? To what extent does it really, truly benefit this group? [...] It is a long-term issue, and you can see now how... people are going to pay more monthly than they did with gas. – intermediate

Besides, because of urgency to fulfill national climate goals, current collective heat transition plans often fail to integrate broader neighborhood challenges, resulting in heat transition endeavors perceived as half-solutions that also fall short of addressing long-term needs.

Additionally, while individuals seemed to recognize the potential long-term benefits of collective heat solutions, these benefits were often considered abstract and uncertain, as they were not visible yet in the present. Practical barriers such as, age, financial constraints, or the mental burden of planning ahead made it challenging for people to prioritize (potential) future benefits over immediate concerns. For many, engaging with long term plans remained out of reach when present needs remain unmet.

As the example of heat transition contexts shows, role and role uptake evolve over time and are influenced by time considerations of urgency. These patterns do not describe energy citizenship directly, but they do show the conditions under which citizen roles are formed, delayed, or foreclosed. With this we show the value of understanding EC as dynamic, in order to be able to grasp roles and role uptake of citizens in energy transitions.

3.4.2 EC as an embedded endeavor

EC discourse often focuses on isolated citizens' doings (acts and expressions). Our analysis reveals that roles and role uptake of citizens do not unfold in a void, but are influenced by institutional (market) rules and structural (in)capabilities that are in place. This supports the merit of understanding EC as embedded: shaped by its institutional, economic, and social contexts.

Our study of the heat transition context revealed how *institutional market rules* shape the roles and role uptake of citizens in energy transitions. Unlike earlier energy infrastructure projects in the Netherlands, such as the roll out of the gas network, todays' heat transition is increasingly market driven. In this setting, market players (primarily heat providers) include different considerations than before into their business model. They are not only responsible anymore for their business case (including customer acquisition), but also for the construction and investment costs of the network. Although partial subsidies for the network costs exist, investments are only viable if enough residents commit to connecting to the heat network. Additionally, many heat networks require insulation upgrades making providers dependent on the cooperation of home-owners and housing corporations, and on the alignment of municipal plans, on which housing corporations act.

These shifting responsibilities and reliabilities drove providers to favor fixed, monopolizing, contracts (in order to close the business case), and passing rising

investment costs onto consumers through higher heat prices. While heat prices are regulated and monitored by the ACM (Netherlands Authority for Consumers Markets) providers are allowed to ask the maximum legal price.

Interviews with residents and housing corporations revealed that these prices were often perceived as driven by profit maximization rather than actual costs. Although the price buildup is publicly available, they were considered untransparent due to complexity of calculations. Due to this lack of transparency, many actors perceived heat providers as neglecting their responsibility for a fair system, and distrust toward the government fostered as it appeared unable to address these legal, yet unfair market rules. These formal market rules not only facilitated monopolistic providers, but also defined the agency of citizens to act or actively take a stance, and thus take a certain role. This led to some actors taking a stance on behalf of citizens:

> And secondly, the ACM needs to genuinely start protecting consumer interests. Not rely on some vague excel sheet that gives the heat providers so much leeway that the end user becomes the one paying the energy transition bill. – housing corporation

Amid this dynamic, a housing corporation started to adopt a new, interesting, role to challenge these institutional rules. In one case, the housing corporation started to actively oppose a heat provider's attempt to shift the financial burdens to low-income tenants.

> So we draw a line in the sand: this is going too far if this is not going to be fixed, we will hold the brakes. Heat providers are pushing back now and say: housing corporations need to cover the gap. To that we say: NO! With that you shift the bill of the heat transition to the poorest tenants in the city. That is something we are not going to do. – housing corporation

In addition to institutional rules, we saw that (the possibilities for) roles of citizens, especially in vulnerable neighborhoods, are influenced by a *structural lack of capabilities* of financial, organizational, and jurisdictional nature. For example, homeowners and homeowners associations expressed lacking the financial capabilities to engage with energy transitions, despite available subsidies and interest-free loans. As a civil servant explained:

> People think: if I am already not heating my home because I cannot afford it, my energy costs are low, and if I take out a loan to invest in sustainable heating, my costs will go up regardless. – municipality

> To give you an idea, the goal of the Heat Transition Vision is a gas reduction of 20% by 2030 in the whole of Brunssum. But, actually we already reached that goal last year [2023], even 22%! But then you can think as a municipality "we are doing great", but it was mainly because people were too afraid to use the heating because of high costs. – municipality

This was even more complicated in homeowners associations due to organizational incapability: engagement in housing associations tends to be low, despite the need for democratic decision-making. For tenants, ability to take a role was even more limited due to limited jurisdiction. They can mostly relate to energy transitions through limited procedural means (the right to give or withhold consent when it comes to collective energy solutions) as landlords and housing corporations are the ones having the mandate and thus the responsibility to take an active role in energy transitions.

These observations show that the possibilities for citizens to assume roles are shaped by existing market rules and structural lack of capabilities. With this we underscore the value of EC being understood as embedded, not coming about in a void but constituted in relation to broader systemic conditions.

3.4.3 EC as a cross-actor endeavor

While EC is often associated with citizens-alone, our analysis shows the merit of understanding EC as a cross-actor endeavor. Citizens' roles do not unfold in isolated 'citizen groups', but in interaction with, in relation to, or in dependence of multiple actors. This became evident as the role uptake of citizens came about in interaction with other actors' doings, strategies, and approaches.

For example, in the local heat transitions we studied, one actor's role uptake significantly influenced how other actors assumed theirs. This *relational* dynamic showed that actors were more likely to start acting when they see others contributing with responsibility uptake as well. As one housing corporation explained:

> So, it is not that we are saying "we do not want that role". We still really want it, but government, municipalities, heat providers – take your role, take your responsibility, and do not keep passing the ball back to the tenant. – housing corporation

This dynamic extended beyond organizations and also impacted citizens. Residents were more willing to commit to collective heat transition efforts when they trusted that other actors are also taking a role in climate change mitigation efforts. For instance one resident shared:

> [Memo from fieldnotes Pendrecht]: Her [resident] neighbors did not want to become gas-free. They believed the government should first hold companies accountable for climate change mitigation, before expecting residents to contribute with expensive housing insulation efforts and switching from gas.

With that, trust in other actors played a crucial role in this dynamic. Discussions around monopolistic heat providers highlighted residents' distrust in fair collective heat transition efforts, particularly they distrust whether (national) authorities were effectively protecting residents' interests. As one housing corporation noticed in their interaction with residents:

> The ACM, let's say, determines the price, well, the prices are determined there. But does a resident fully trust that? That is the question. And that plays an important role. So, you have a provider delivering the service, and for the resident, it often comes down to "Do I have trust in that?"– housing corporation

> [Memo fieldnotes Nijverheid]: The housing corporation had carried out renovations to her [resident] home, and they had told her that they would not charge the costs to the tenants. But since those renovations she already experienced two rent increases of twenty euros each. So when it comes to the heat network, she did not trust that the proposed costs would be the real ones either.

Municipalities' *approaches* to citizen engagement further demonstrated how (interaction with) other actors shape uptake of citizens' roles. These approaches, ranging from unburdening to co-decision-making, significantly shaped citizens' (possibilities for) role uptake in different ways.

Unburdening strategies implied two things. On the one hand offering residents a straightforward heating option, requiring only their consent by signing an intent declaration for connection. On the other hand unburdening implied financial help through subsidies or loans to ease the financial burden, primarily for homeowners. Unburdening strategies are relative towards tenants or home-owners, as for tenants of housing corporations unburdening implied the corporation managing everything on their behalf, with only a signature required from the tenants.

> We will install the Perilex connection in the kitchen and adjust the fuse box. All at our own expenses. And they [tenants] will receive a hob and pans so that they won't have any costs and can transition easily.– housing corporation

Unburdening strategies relied on two assumptions. Firstly, reducing the required effort from residents would increase acceptance. Secondly, especially in less privileged contexts, people are already over-asked, and people might prefer less partici-

pation demands. However, residents partially challenged these assumptions. Many viewed it as the government's responsibility to provide a heating choice, as long as it is considered fair (unburdening needs to be a fair trade-off between giving up choice for a fair decision). Additionally, unburdening approaches often failed to address the needs of those in most problematic homes, as they required other pressing things to be unburdened from, not necessarily a limit in choice options or partial financial support for a heat transfer. Consequently, this approach with flawed underlying assumptions influenced citizens' willingness to engage with collective solutions.

In another case, the neighborhood committee was invited to contribute ideas for the best collective heat solution. However, unclear roles led to different expectations: residents expected to have a choice and engaged in conducting research, while the municipality saw its role as providing the facts. This misalignment triggered a "knowledge battle" resulting in opposition and protest towards the heat network, as well as diverging participation strategies. Residents sought to have their voices heard elsewhere, mobilizing political actors to support their cause.

> And of course we also had a few... little strategies, like inviting political parties individually. 'What do you think about this?' 'We [resident committee] think this and that', and then they would agree with us. Of course, that is not appreciated within the city council because then we are already building support or something. One time we informed the entire council. That was not appreciated by the bench of Mayor and Alderman. – resident

The municipality instead, aimed to establish clearer expectations and more strategic involvement and set the level of participation from the start.

> In some neighborhoods, we have decided not to run participatory processes anymore. Because, co-creation and advisory approaches can mislead people. Sometimes there is only one option, and then we are going to do that. As a municipality we have to make tough decisions. That is a lesson we learned from the pilot. – municipality

As the heat transition context highlighted, role formation is relational and shaped by dynamics between citizens and other actors. These dynamics emphasize that role uptake of citizens is influenced by the role uptake of other actors doings' and their strategies, which impacts how citizens (can) relate to energy transitions and take up roles. It shows role formation is not an individual act, but something shaped through interaction, and shows the merit of understanding EC as a cross-actor endeavor.

3.4.4 EC as a fluid endeavor

While academic literature seems to apply EC in a way that only captures solid categories of acts and expressions, such as pro/con positions, individual/collective solutions, or binary actions like doing/not doing, our analysis shows there is value in understanding EC as inherently fluid. Our analysis reveals that actions and expressions related to roles and responsibilities are not cemented or predefined (out there to be measured or given), rather they emerge through what we call a "negotiation" process, based on multiple considerations. Understanding EC as fluid, helps to capture this *negotiation* process.

By examining collective heat transition cases, we found that attitudes towards collective or individual solutions are carefully weighed. Individuals considered multiple factors before expressing or acting on certain heat solutions, demonstrating that expressions and acts are not predetermined but deliberately considered. For example, residents balanced personal control of choosing their energy provider against the fixed reliance on collective systems, especially amid rising costs and insulation needs. Some favored individual solutions to contribute to climate goals in a timely way as opposed to waiting for delayed collective heat networks. Others weighed personal affordability against abstract societal benefits of collective heat solutions. As one local authority highlighted about this weighing process:

> And it might mean indeed, for some, that it becomes more expensive, so not the lowest costs for everyone individually, but ultimately the lowest costs for society as a whole. And that is where the real tension lies, right? – municipality

Roles and responsibility uptake were also shaped by how people *relate to the problem* of the need for energy transitions itself. As we found, not everyone felt personally connected to the heat transition as a problem. Instead, they channeled their energy and responsibilities towards issues they felt more strongly about, such as neighborhood livability or community solidarity. These alternative roles influenced how much role-uptake capacity they had left to engage with the heat transition. More importantly, this showed that citizens often base their involvement or role uptake on how they relate to a certain "problem". We also observed that within this weighing process of how the individual relates to energy transitions, people are more likely to take responsibility when they have a degree of control over their actions and their impact. This sometimes resulted in choosing to take a role towards more concrete local (sometimes short term) action than those related to the energy transition. As two residents explained:

> If I ask other people to join for a short term voluntary contribution for the committee they are more willing to say "yes". But if I ask them for a long-term contribution [like the heat transition] they will tell me "no" – resident

> [Memo fieldnotes Nijverheid]: Her [resident] goal with her art is to create an experience, making something together with recycled wool, that was something she related more to than the heat transition itself, and the reason why the resident was involved in voluntary knitting meetings in the neighborhood instead of other activities.

As our results indicate, roles emerge through negotiating multiple considerations, reflecting fluid processes rather than predefined categories of acts and expressions. To capture this process behind role uptake, there is value in understanding EC as fluid. This fluid understanding of EC differs from the dynamic understanding, as a fluid understanding encompasses how individuals arrive at their roles, rather than simply tracking changes in certain roles over time.

3.5 Discussion

Our results speak for a more comprehensive understanding of EC, demonstrating the value of understanding EC as a dynamic, embedded, cross-actor, and fluid endeavor. In this section, we connect the results to this broadened analytical (processual) understanding of EC and discuss how it increases possibilities for revealing processes, frictions and structural conditions that shape the enactment of energy citizenship within energy transitions. In Table 3.3 the results and proposed understanding of EC are summarized.

Table 3.3. Towards a dynamic, embedded, cross-actor, and fluid understanding of EC

Results	Proposed analytical understanding of EC
Roles and role uptake of citizens evolve over time and around questions of time	EC as a dynamic endeavor
Roles of citizens do not unfold in a void but are embedded in institutional rules and structural lack of capabilities	EC as an embedded endeavor
Roles and role uptake of citizens come about in interaction with and in relation to other actors' doings, strategies, and approaches.	EC as a cross-actor endeavor
Roles and role uptake of citizens are not given but evolve though negotiation of different considerations and relation to the problem.	EC as a fluid endeavor

By examining how roles and responsibilities emerge in different contexts (temporal, multi-actors, non-entrepreneurial and collective contexts) than the ones currently dominant in EC discourse, we explored a more comprehensive understanding of EC. With such an understanding we reveal different aspects of importance for the formation of citizens' roles. This is something the current (status) understanding of EC does not enable sufficiently, which hinders our ability to grasp lived realities including frictions and structural conditions related to enacting citizens' roles and responsibilities. Current EC discourse primarily focuses on

understanding the different roles citizens can play in energy transitions, thereby associating EC with rather static, citizen-alone, endeavors. Yet, our research shows that EC may be better understood as a dynamic and cross- actors endeavor as citizens' roles and role uptake change over time and unfold in interaction with or relation to various actors, including local authorities and market players. What is more, our analysis shows that roles and role uptake are carefully negotiated and considered, challenging the idea of energy citizenship being associated with clear, predetermined, or idealized roles for citizens in energy transitions. As roles do not unfold in a void, our study emphasizes that these dynamic and fluid roles and responsibilities are deeply embedded within the broader structures of our energy system, which are shaped by multiple actors simultaneously (e.g., citizens, local authorities, and market players). What our results show is that roles and role uptake are continuously shaped and constrained by structures that these various actors create together (e.g., rules, lack of capabilities). Taking this into account we show the value of understanding EC as embedded and fluid.

What this more comprehensive understanding of EC implies as well, is that EC cannot be fully understood by examining citizens in isolation. It requires considering the networks of actors and structures in which citizens are situated, or are excluded from. As an embedded and cross-actor understanding suggests, roles of citizens are inherently tied to broader system dynamics which requires expanding the scope of studying EC by including a diverse range of stakeholders, revealing how these complex structures and interactions co-produce and re(de)fine energy citizenship.

More specifically, this broadened understanding of EC enabled us to better understand the structural lack of capabilities that shape role uptake in energy transitions. Through our case studies, we highlighted how everyday life experiences reflect the tangible impacts of structural incapabilities and vulnerabilities, implying that these issues are not solely created at the local level and cannot be fully addressed at that level. They stem from complex, multi-layered systems, including relationships with other actors like market players. As a result, local opportunities for role uptake are shaped by larger, systemic inequalities, which shape citizens' possibilities to relate and engage with collective energy transitions the way they want. Understanding EC as embedded enables the recognition of this structural lack of abilities influencing citizens' roles, an issue that often remains neglected in EC discourse (Lennon et al., 2020).

These insights help further unpack the agency paradox referred to in EC literature: while EC depends on citizen activation, it often only gains traction through the intermediation of various institutions (Pel & Huhnt, 2025). This reveals the complexity of embedded agency. Citizens' capacity to act is shaped and often lim-

ited by overlapping mandates and actions across multiple institutional levels, over which they hold various degrees of influence. Our findings show that direct expressions of agency by citizens were limited. Aside from withholding legal consent, most action occurred *on behalf of* citizens (e.g., by housing corporations advocating for just prices for tenants). This is no evidence of a complete absence of agency. Rather, it reveals potential first avenues through which EC can begin to take shape in more vulnerable contexts. It calls for a more nuanced understanding of agency, as something situated, relational and constrained, yet with the potential to become transformative when extensively intermediated by other actors who advocate for inclusive citizen roles. This builds on the work of DellaValle & Czako (2022) who outline pathways for empowering energy citizenship among people experiencing energy poverty.

3.5.1 Opportunities and limits of a more comprehensive understanding of EC

What we show is that this more comprehensive understanding of EC helps to illuminate the lived realities, frictions, and structural conditions that shape EC enactments in energy transitions. By broadening the conceptual lens, it becomes possible to develop a more inclusive approach, one that draws attention to and includes individuals and groups often overlooked in existing EC discourse. By moving beyond narrow interpretations of agency and participation, our perspective enables a more inclusive reading of EC that recognizes both visible and less visible forms of engagement, as well as resistance and exclusion. In doing so, it complements existing EC literature which often focusses on groups that are able (to act or not act) and (un)willing (express positive or negative stances towards energy) (Laakso et al., 2023; Schlindwein & Montalvo, 2023). This framing tends to neglect individuals who do not meet any of the enabling conditions required to relate meaningfully to energy transitions. Our approach enables including and drawing attention to those who are (un)willing but *unable* to act on it. By accounting for these overlooked positions, our framing contributes to a more inclusive and empirically grounded conceptualization of citizenship, one that better reflects the complexity and diversity of lived experiences within energy transitions.

While a more comprehensive understanding of EC offers valuable insights into the lived realities and constraints shaping participation in energy transitions, it also raises important questions about the conceptual boundaries of EC itself. As the literature suggest, EC remains an evolving and open-ended concept. However, if stretched too far, it risks becoming analytically diffuse and difficult to operationalize. There is a real concern that without boundaries any orientation towards energy (whether active, passive, or constrained) could be labeled EC. Our findings confirm that EC can be associated with diverse expressions towards energy transitions (people holding both negative and positive stances toward collective heat transitions). Yet, acting on these intentions or expressions was frequently limit-

ed by material or institutional constraints limiting people's capacity to participate or resist. This raises critical questions about whether and how non-action (when rooted in structural incapacity rather than deliberate choice) can be meaningfully framed as a form of EC. While deliberate inaction, such as refusing to sign a heat contract, can be a form of agency or empowerment, structural incapacity complicates this picture. Laakso et al. (2023) offer one solution by including an understanding of EC where acts are 'motivated, oriented, and intentional', including intentional and oriented 'resistance' (Laakso et al., 2023, p. 698). However, even this definition may fall short if it assumes a baseline of individual capacity. Our findings suggest that without accounting for the structural conditions that preclude intentional action altogether, important forms of (dis)engagements risk being excluded from the conceptual frame. To address this, our approach does not mean to treat all orientations as EC by default, but instead emphasize the importance of situating expressions, actions and inactions within their specific social and institutional contexts. This allows for distinguishing different forms and conditions of engagement without losing sight of power asymmetries and constraints.

3.6 Conclusion

In this research we aimed to better understand how and why citizens assume particular roles and responsibilities and how these enactments can inform a more comprehensive understanding of EC. By examining various aspects of local heat transitions we got a better understanding of how and why individuals relate to energy transitions, and we demonstrated that EC can be understood as a dynamic, embedded, cross-actor and fluid endeavor.

By moving beyond a status-oriented conceptualization of EC, our study demonstrated how a more comprehensive (processual) understanding is better able to do justice to the structural conditions and lived realities in relation to enacting citizens' roles and responsibilities in energy transitions.

Current conceptualizations often lack this dynamic, embedded, cross-actor and fluid understanding, thereby neglecting a better understanding of the structures around role-and responsibility formation of citizens. As we showed, structural lack of capabilities influence citizens' roles, but current understanding of EC mostly focus on roles and responsibilities alone, as if they are happening in a void. By understanding EC as dynamic, embedded, cross-actor and fluid we were able to grasp the structural lack of capabilities influencing role formation thereby understanding role uptake of citizens more thoroughly.

Additionally, we have shown that current understandings of EC associate the concept with certain, static, acts mostly focusing on citizens that are able. This risks overlooking the experiences and capacities of more vulnerable groups. Our findings

highlight the opportunities that emerge when EC is approached more comprehensively, one that accounts for structural conditions of citizen role enactments. As EC is a concept that focusses on roles and responsibilities it must remain critical of how and when it is used. This is especially relevant in the context of just energy transitions, where notions of empowerment should not reproduce existing (elitists) connotations by centering only on the able bodied and resource-rich. We have demonstrated how a more comprehensive understanding of EC can counter these exclusionary tendencies by uncovering the processes and structural conditions through which EC is enacted. Such a perspective enables the inclusion of groups that are often marginalized in dominant conceptualizations.

With this, we propose an understanding of EC that captures lived realities rather than leaning on normative or prescriptive ideals about what citizens should do in energy transitions. Instead of asking "What is EC", we found more value in exploring "What makes EC", a shift that is crucial for developing a more holistic and actionable understanding of how citizen roles are formed in energy transitions.

We argue that EC remains a valuable analytical concept as long as it does not reproduce elitist connotations. Our findings underscore the value of understanding EC as an embedded, cross -actor, fluid and dynamic endeavor. This way of thinking is also relevant for policy and has some concrete implications to better align policies with lived realities. As our findings suggest, policies should support flexible and evolving forms of citizen engagement, recognizing that energy citizenship is dynamic and roles shift over time and over questions of urgency. This leads to a second implication: the need for structural capacity-building, particularly in vulnerable neighborhoods. A first step could be through EC advocates or representatives acting on behalf of citizens in energy transitions. This would create first avenues for meaningful participation while at the same time address embedded inequalities that limit meaningful participation. Third, there is a need, for example as municipalities, to reflect on own institutional arrangements like participation approaches, as they influence how citizen roles are shaped. Finally, policies must allow for negotiation and pluralism in defining energy problems and solutions, acknowledging that energy citizenship is a fluid process that cannot be rigidly prescribed and comes about through negotiation processes and one's relationship to the problem.

A more comprehensive understanding also has theoretical implications. As explained it has opportunities to move beyond elitist connotations. But broadening the scope also points to a need for continued debate on how to conceptualize EC in ways that remain both inclusive and analytically precise. To further develop this perspective, we see strong value in closer engagement between other fields like energy justice and public engagement to refine these debates. These disciplines

offer valuable conceptual tools for understanding how structural conditions and inequalities shape peoples' agency in energy transitions. While a full integration of these literatures lies beyond the scope of this paper, we argue that drawing on such insights could support this debate on what it means for (the boundaries of) EC when engagement is enacted under conditions of constraint or mediated by others. As our findings are based on a limited number of case studies in vulnerable urban neighborhoods, future research should examine how EC unfolds across a broader range of settings (such as rural areas or different governance regimes) to evaluate the wider applicability of our proposed dynamic, embedded and relational approach. Such comparative work is essential for refining the concept of EC, particularly in relation to vulnerable groups, and for illuminating both its potential and limits across different contexts.

Eindnoten

4. Data from Pilot pages PAW Nationaal Programma Lokale Warmtetransitie | www.nplw.nl/proeftuinen
5. Statistics from 2021 (no later data available). Statistics have been cross-checked and compared with years 2020, 2019, 2018, 2017 and 2016 to draw reliable conclusions on stability of income level over years.
6. Foto's Brunssum-Noord, Brunssum (2021), Programma Aardgasvrije Wijken | www.nplw.nl/proeftuinen
7. Foto's Nijverheid, Hengelo (2022), Programma Aardgasvrije Wijken | www.nplw.nl/proeftuinen
8. Foto's Pendrecht, Rotterdam (2019), Programma Aardgasvrije Wijken | www.nplw.nl/proeftuinen
9. Based on publicly available information on PAW project websites and municipal information.
10. Residents were approached after invitation advertisement set up by the researchers.

Chapter 4

Tensions in Local Heat Transitions

This chapter is based on Kluskens & Höffken (2026)

Abstract
Neighborhood-level transitions from fossil-based heating to sustainable alternatives are central to Dutch climate policy, yet progress remains slow, especially in socio-economically vulnerable areas. While a growing body of research examines challenges in heat transitions, existing research often examines actors in isolation. This overlooks the interdependencies and interactions that shape collective neighborhood transitions, limiting understanding of why actors respond as they do, how tensions arise, and why collective approaches frequently stall.

This paper addresses this gap by adopting a relational perspective to neighborhood heat transitions, informed by institutional logics and acceptance literatures. By drawing on qualitative data from Dutch neighborhood heat transition initiatives, the study analyzes how actors' meaning systems, norms, and patterns of reasoning shape interactions and generate tensions around participation, privatization, funding, urgency, and the neighborhood-level approach.

The analysis identifies two mechanisms through which stagnation emerges: (1) misaligned meaning structures that hinder shared problem definitions and agreement on solutions, and (2) limited attention to interpersonal dynamics, such as trust, emotional responses, and interpersonal engagement, which amplifies conflicts and undermines cooperation.

The paper proposes three leverage points for advancing collective heat transitions: fostering substantive transparency about constraints and trade-offs; investing in relational quality across actor groups; and using time deliberately to support both substantive and interpersonal alignment. The study contributes a relational understanding of how stagnation emerges in collective transition processes and offers practical guidance for strengthening neighborhood heat transitions, emphasizing that progress depends not only on technical solutions but on aligning meaning systems and nurturing relationships.

4.1 Introduction

The global urgency to combat climate change has placed energy transitions to the forefront of policy agendas worldwide. Within this context, heat transitions, the shift from fossil fuel-based heating systems to sustainable alternatives have gained increasing attention. In the European Union, decarbonizing heat is considered crucial for reducing CO2 emissions, given that heating remains the largest end-use of energy and a major source of carbon emissions (Dubois et al., 2019; Regulation 2018/1999, 2018). While some countries have made progress, the International Energy Agency (IEA) stresses that greater efforts are needed (International Energy Agency, n.d.). Compared to electricity transitions, heat transitions present particular complex challenges. Even more than with electricity transitions, heat systems are deeply embedded in daily life, making their transition particularly intrusive, as it necessitates direct interventions in people's homes and routines. Heat transitions, therefore, pose complexities that extend beyond technical feasibility into the realm of social coordination and governance (Sovacool & Martiskainen, 2020).

In the Netherlands, the heat transition is a major policy priority, embedded in the Climate Agreement (Rijksoverheid, 2019) and operationalized through the National Program for Local Heat Transitions (NLPW, 2022). A central feature is the neighborhood-level approach, intended to allow for efficiency gains by grouping similar housing types, reduce costs through economies of scale, and align heating upgrades with other infrastructure projects (Rijksoverheid, 2019; Scholte et al., 2024). Policy makers further hoped that the neighborhood level would boost community participation, strengthen local democracy, and be the ideal scale to address broader social issues including energy poverty, poor housing conditions, and unemployment (Rijksoverheid, 2019; Scholte et al., 2024).

Yet, in practice, neighborhood-level implementation is progressing slowly, if at all, particularly in disadvantaged neighborhoods. Our empirical research identifies a fundamental challenge at the heart of these transitions: the collective nature that characterizes the neighborhood-level heat transitions itself. This collective approach can take the form of shared heat infrastructure (e.g., heat network) or synchronized individual solutions (e.g., bulk purchase of heat pumps). Either way, unlike individual climate mitigation measures, such as the uptake of solar panels or electric vehicles, neighborhood heat transitions inherently require extensive coordination and agreement across multiple actors (like residents, municipalities, and housing corporations) each with distinct roles, responsibilities and interests (Herreras Martínez et al., 2022; Rodhouse et al., 2021).

Progress depends on these multiple actors reaching some form of agreement and alignment, yet, it is precisely this diverse set of actors that creates a web of tensions,

often impeding progress rather than facilitating it. These tensions extend beyond technical feasibility, including participation versus unburdening approaches (the extent to which residents should be actively involved versus having decisions made for them) or individual versus collective heating solutions (personal choice versus shared infrastructure). We find, that these tensions are not simple 'misaligned responses', but reflect deeper mismatches between what drives actors and how different actors envision what the transition should achieve and how it should unfold.

Existing research has addressed both the technical and social complexities of heat transitions. Technical challenges often center on tensions between individual and collective heat solutions, often framed in technical terms, such as trade-offs between decentralized versus centralized heating systems (Lund et al., 2010) or between low-and high temperature district heating systems (Schmidt et al., 2017). Social challenges have likewise been explored, including conflicting actor interests, analyzed through e.g., the principal-agent concept (Reidl & Wüstenhagen, 2025), the influence of incumbency logic and market interests on transition pathways (Reda et al., 2021), and concerns about economic justice, such as fair cost distribution in heat transitions (Furtado et al., 2019). Likewise, the differential impacts on high-and low-income households (Carrión et al., 2018) as well as participation challenges in collective energy community projects have received attention (Teladia & van der Windt, 2024).

Despite a growing body of research addressing challenges and lack of progress in heat transitions, most studies analyze actors in isolation, examining fixed attributes such as preferences, visions or interests of distinct stakeholder groups (e.g., residents, municipalities or incumbents) (e.g., Becker et al., 2023; Lowes & Woodman, 2020; Schmidt et al., 2017; Thomas et al., 2024). This tendency to treat actors as separate analytical units, overlooks the interdependencies and interactions that characterize collective efforts like neighborhood heat transitions. As a result, current research lacks a systematic understanding of why responses and actions occur, and fails to explain how they crystalize into disagreements and tensions that hinder progress on the ground. This is particularly problematic in vulnerable neighborhoods, where socio-economic challenges amplify the complexity of multi-actor agreement and alignment. Elsewhere, evidence shows that tensions or alignment do not arise in isolation, but emerge because actors' (contrasting) ideas, actions and expectations relate to and interact with those of others, both within and between actor groups (Kluskens et al., 2024). Ignoring these interrelational dynamics risks misinterpreting the roots of conflict and overlooking what makes collective approaches so challenging in practice. Without insight into the relational aspects, current approaches risk designing policies that appear viable on paper, but fail to resonate with the lived realities, leading to unresolved tensions and dis-

agreements that can paralyze transition efforts, making it particularly difficult for collective approaches to succeed.

To address the persistent tensions and stalled progress in neighborhood heat transitions, we propose a shift toward a relational perspective; one that examines what drives actors' actions and interactions over time and how their positions are shaped in relation to one another. This paper adopts such an approach to systematically analyze the mechanisms through which tensions emerge in collective heat transitions. Rather than solely focusing on actors' responses, we investigate the underlying drivers of actors' (inter)actions and how they result in disagreements and tensions about how the transition should unfold. For that, we focus on the underlying logics (e.g., reasoning patterns, expectations, norms) that guide their actions and shape interactions. These logics influence and explain where and how (dis)agreements arise, explaining why misalignments persist and progress stalls. Specifically, we unpack the dominant logics enacted by different actors around key friction points in neighborhood heat transitions, topics that require agreement but often become sites of tension. This relational lens is crucial not only for identifying why and where misalignment occurs, but also for uncovering potential leverage points: opportunities for intervention that can foster agreement and alignment, and accelerate transition efforts.

Ultimately, the aim of this paper is twofold: first, to advance heat transition literature theoretically by offering a relational perspective on the mechanisms that impede local energy transition progress, and second, to identify potential leverage points by uncovering both barriers to change and opportunities for generative action within the network of actors involved. The research question guiding this study is: What tensions characterize neighborhood heat transitions, and where lie leverage points for advancing collective heat transitions?

Our research is structured as following: Chapter 4.2 provides the theoretical context and analytical framework. Chapter 4.3 gives the methodology, which will be followed by the results in Chapter 4.4. Chapter 4.5 and 4.6 give the discussion and conclusion.

4.2 Theoretical framework: a relational perspective on tensions in heat transitions

To capture the complexity of and conceptualize tensions in neighborhood heat transitions, we adopt a relational approach that integrates relational acceptance and institutional logics. This approach is primarily epistemological, focusing on how actors' interactions and interpretations co-produce tensions and alignment over time. Relational acceptance captures the actor interaction dynamics of agreement and misalignment, while institutional logics adds the interpretive dimension, revealing

the meaning systems, norms and reasoning patterns that guide actors' expectations and actions. Together, these frameworks provide a novel analytical lens to explain mechanisms that produce tensions and deadlocks in neighborhood heat transitions.

We begin by reviewing existing literature on actors in heat transitions, exploring what the literature reveals about their roles, perceptions and interdependencies. Building on this, we reconceptualize tensions as a challenge of acceptance, emphasizing how misalignments between actors emerge and persist in relational contexts. Finally, we introduce institutional logics as a deeper explanatory layer that sheds light on the underlying meaning structures shaping these tensions.

4.2.1 Actors in heat transitions: insights from existing research

Much research on actors in heat transitions has focused on either individual perceptions or institutional actors, often treating these levels in isolation. At the individual level, significant attention has been given to public perceptions of specific heating technologies. For example, studies have attributed lack of progress to people's unfamiliarity with new technologies and high satisfaction with existing heating systems (Becker et al., 2023). These studies typically adopt heating technologies as their unit of analysis and underplay how perceptions are shaped by individuals' positions in or interaction with broader social an institutional networks.

Some researchers have moved beyond residents, and included public and private actors. For instance, Herreras Martines et al., (2023) investigated how key public and private stakeholders view funding and ownership models for district heating. Similarly, Lowes and Woodman (2020) examined what hinders progress from the perspective of policy makers. Contrary to assumptions of purely rational decision-making, they demonstrated that beliefs, values and institutional contexts affect how decisions are justified. For example, lack of progress in heat transitions was attributed to perceived uncertainty and bounded rationality. They showed that uncertainty and the perceived need for more knowledge among policy makers were used to justify inaction, though other concerns, such as consumer disruption, also played a role. These findings suggest that even among professionals, progress is shaped by more than factual knowledge; it is entangled with interpretive processes and organizational contexts. However, even in studies that look beyond residents, perceptions are often conceptualized as stakeholder-specific rather than co-constructed through interaction.

A growing body of work has started to address the relational dimensions of perception and actions in heat transitions. For example, Bögel (2024) and Thomas et al. (2024) show that people's perceptions of disruption during heat transitions are shaped by their relationships, not just with technology, but also with other people, their homes, their routines, and their sense of self and place. While these insights

foreground the social embeddedness of individual responses, they largely focus on everyday relationships (intra-group) rather than the interdependence or relationship between different actor groups engaged in heat transitions (inter-group).

Some studies explicitly address the importance of coordination and alignment between actors. For example, Bush et al. (2016) emphasize the need for local authorities to coordinate and align visions across sectors in order to enable new roles and responsibilities in district heating systems. On the more institutional level, Herreras Martínez et al. (2022), describe how municipal progress is constrained by limited capacity and knowledge, technical uncertainties, and lack of enabling instruments from central governments. Complementary to these perspectives, pathway-oriented research offers a more systemic view of heat decarbonization, highlighting temporal dynamics, branching decision points, and the multiplicity of possible trajectories, thereby emphasizing more macro-level dimensions (Grandin & Sareen, 2020; Lockwood & Devenish, 2024; Rosenbloom, 2017). Yet, overall, research continues to treat actors such as residents, municipalities and other institutional players as separate domains. Especially coordination challenges at the local level are often reduced to either attitudinal barriers (mostly on citizens side) or governance gaps (on the institutional side). This tendency obscures how tensions emerge and persist in the interactions between actor groups, often as a result of deeper interpretive and normative misalignments.

Thus, while existing research has advanced our understanding of both individual and institutional factors, there remains a need for approaches that explicitly account for the interactive and relational processes through which tensions emerge and evolve. In the next session, we introduce how a relational perspective on acceptance can help with this conceptual gap.

4.2.2 Tensions in heat transitions as a challenge of acceptance

We propose to understand these persistent tensions in neighborhood heat transitions as a challenge of acceptance, but in a relational and procedural sense. The concept of acceptance has traditionally been used to examine how individuals support or oppose energy transitions, often measured through attitudes or behavioral intentions towards specific technologies or projects (Wolsink, 2007a; Wüstenhagen et al., 2007). Also in the context of heat transitions we find examples where acceptance is studied in relation to a specific technology (district heating), with a focus on whether citizens find a system acceptable in terms of cost, comfort, or reliability (e.g., Onencan et al., 2024). Even when these studies acknowledge broader social factors, such as trust, familiarity, or capabilities, they tend to treat acceptance as something that resides within individuals, instead of something co-produced through ongoing interaction between actors.

However, this outcome-oriented perspective is insufficient for capturing the multi-actor set-up and dynamics that characterizes heat transitions in the Netherlands. In such contexts, it is less useful to understand acceptance as a matter of individual disposition, but more as a product of evolving relationships and interactions among (institutional) actors navigating a complex and evolving transition landscape (Kluskens et al., 2024).

Recent research has increasingly called for a relational and more procedural perspective to social acceptance (Batel & Rudolph, 2021; Wolsink, 2018). Rather than viewing acceptance as a fixed end state or individual attitude, this approach understands it as an ongoing process shaped through interactions among actors situated in specific institutional, spatial, and material contexts (Aitken, 2010; Batel et al., 2013; Huijts et al., 2019). Acceptance thus becomes not merely something about agreement with a particular technology or plan, but about how roles, expectations, and responses become aligned across multiple actors towards multiple objects of acceptance, such as themes, decisions or interventions that must be coordinated to enable progress (Kluskens et al., 2024). Acceptance thus becomes a relational achievement: something that is negotiated, maintained, and sometimes refined over time. Crucially, it is not the domain of residents alone, but the joint product of multiple actors interacting within a shared transition landscape (Kluskens et al., 2024; Wüstenhagen et al., 2007).

In this relational view, acceptance is not a final outcome, but a process shaped by how actors respond to each other's roles, claims, and actions in a given context. This relational approach shifts the focus from viewing actors as separate units, to understanding how disagreements and the resulting misalignments are co-produced through interaction. It provides a richer understanding of the social dynamics driving tensions, contestations, and deadlocks in heat transitions.

However, while this relational perspective highlights the importance of understanding the social dynamics involved, it still leaves open the question of what informs actors' interpretations of certain aspects in these interactions. Recent studies begin to connect the concept of acceptance with the underlying meaning structures that shape it. For example, de Wildt et al. (2021) demonstrate that heating technologies are not neutral artefacts but carry embedded values. When these values clash with those prioritized by the public or other actors, it can result in value-based resistance, not because actors are uninformed, but because of deeper divergences in what is considered fair, necessary, or desirable. Such findings suggest that acceptance is not merely a matter of perception or behavior, but often reflects underlying conflicts between different meaning structures. To better understand and deepen our understanding of the meaning structures behind these dynamics and the roots of such relational conflicts, we turn to the concept of institutional logics.

4.2.3 Institutional logics as drivers for relational conflict

To understand these deeper interpretative structures we turn to the concept of institutional logics. Institutional logics are socially and culturally embedded meaning systems that structure how actors interpret their environment and guide their behavior (Thornton et al., 2012). They function as worldviews or frameworks in which actors operate, providing repertoires of meaning that shape how individuals and collective actors justify decisions, evaluate others, assign responsibility, and determine appropriate courses of action (Bögel et al., 2019; Thornton et al., 2012). At the same time institutional logics organize how people act and interact; they serve as the organizing principles for institutions by shaping both formal rules (e.g., laws, procedures) and informal rules (e.g., expectations, conventions) that (de)structure social interaction. In other words, logics help define the "rules of the game," allocate authority, and frame both problems and solutions (Fuenfschilling & Truffer, 2014).

Logics are composed of rationalities (including norms, beliefs, and assumptions) that guide what is perceived as legitimate or appropriate in a given context. These rationalities are not only held individually, but are shared and reproduced within institutional fields, shaping collective behavior over time (Fuenfschilling & Truffer, 2014).

This perspective of institutional logics allows us to move beyond surface-level disagreements that might appear as mere attitudinal differences or conflicting preferences, and instead examine the structural and cultural roots of conflict in collective processes. For example, while a municipality might view centralized or neighborhood planning as efficient and necessary to meet climate targets, residents may perceive the same process as top-down and exclusionary. These views are not merely attitudinal differences, but can be understood as reflecting distinct institutional logics (Smink et al., 2015).

Importantly, actors often operate within or across multiple institutional logics, which may align or conflict with one another (Greenwood et al., 2011). This condition, known as institutional pluralism, is particularly present in sustainability transitions, where diverse logics, such as those of the state, market, community, frequently intersect, compete or co-evolve (Fuenfschilling & Truffer, 2016; Smink et al., 2015). Heat transitions are no exception: they are complex socio-technical change processes marked by overlapping mandates, divergent values and competing priorities, often resulting in tensions and trade-offs, as discussed in the introduction.

When such tensions are not explicitly recognized or addressed, they can result in what we call relational deadlocks: situations in which collaboration is neces-

sary, but hindered by incompatible interpretations of aspects of heat transitions (e.g., of what is legitimate, desirable, or even possible). We see value in seeing these deadlocks not just as the result of opposing interests or poor communication between actors, but rooted in institutional and interpretative misalignments. In other words, clashes between the meaning systems that shape how actors see and respond to the world.

By combining a relational perspective on acceptance with institutional logics, our framework seeks to explain how tensions and deadlocks emerge in collective heat transitions. This integrated lens allows us to identify the deeper structural and cultural foundations of tension and conflict while acknowledging the inherently collective and interactive nature of heat transitions. Importantly, it does not assume that consensus is always possible or that conflict can, or should, be eliminated. Rather, it recognizes that while some tensions may be unsolvable, others can be renegotiated though institutional work (Lawrence & Suddaby, 2006): for example by reframing issues to better align with actors' underlying logics, or by designing processes that acknowledge and do justice to multiple logics in such a way that it enhances acceptance and enables progress.

4.3 Methodology

4.3.1 Research design

This research adopts a qualitative case study design to explore the relational dynamics and tensions among the multiple actors involved in neighborhood-level heat transitions. A qualitative research design is particularly suitable for capturing the lived experiences and constructed realities of a diverse group of actors (Creswell & Creswell, 2017), allowing for a deep understanding of how people interpret and navigate complex processes such as heat transitions. A case study methodology was chosen to systematically investigate sources of conflict and potential alignment that shape progress in local heat transitions. Case studies are specially valuable for examining phenomena that occur across multiple settings, as in depth understanding of phenomena in one case can provide insights into broader patterns and mechanisms. They are also effective in describing relational and correlative dynamics between actors, institutions and outcomes (Gerring, 2004).

4.3.2 Case selection

Cases were selected based on a combination of theoretical relevance and variation in contextual factors. The research focusses specifically on neighborhood approaches in disadvantaged neighborhoods in the Netherlands, which have been identified as particular complex sites for heat transitions due to layered socio-economic challenges. The selected neighborhoods share and vary in the following characteristics, explained in Table 4.1.

Table 4.1. Case selection variables

Case selection variables	Explanation
Shared characteristics	
Part of Programma Aardgasvrije Wijken (PAW= now called Nationaal Programma Lokale Warmtetransitie).	Selected neighborhoods are formal participants in the national pilot program for local heat transitions. This ensures that all cases are engaged in a neighborhood-oriented approach to transitioning from natural gas to another form of heating.
Socio-economic vulnerable neighborhoods	All selected neighborhoods have a high share of residents (40%[11]) in the lowest national income decile. This criterion aligns with the research focus on particular complex contexts for heat transitions.
Varying characteristics	
Geographical diversity	Cases are selected from different parts of the Netherlands (West, East, South), representing a variety of spatial, infrastructural and regional governance contexts.
Varying in municipal size	The selected cases span small, medium and large municipalities (Brunssum, Hengelo, and Rotterdam).

By selecting cases that reflect both shared structural features and contextual variation, the study aims to uncover both local dynamics of neighborhood heat transitions and the underlying institutional mechanisms that may be generalizable across different settings. The inclusion of deliberately varied case features, such as municipal size and regional location, enables a more systemic exploration of which patterns are context specific, and which may hold across diverse environments. This grounding in rich, context-specific practices and dynamics, enabled researchers to draw meaningful comparisons and identity patterns that may be generalizable across cases.

4.3.3 Data collection

Data was collected through interviews, field visits and observations, and documents related and relevant for the particular neighborhood-level heat transition contexts, in accordance with, and with approval of the standard set by the Ethical Review Board of Eindhoven University of Technology[12].

Interviews were conducted with a diverse group of key stakeholders involved in neighborhood level heat transitions, including residents, local governments, housing corporations, heat providers and other relevant actors engaged in the collective transition process. Participants were identified and selected through purposeful sampling to capture a wide range of perspectives and lived experiences within selected neighborhoods. This was followed by snowball-sampling, which helped identifying additional relevant participants and ensured inclusivity by locally embedded understandings of relevant stakeholders, especially those less visible in formal institutional roles. To minimize potential research bias, random selection within the predefined criteria[13] was applied (e.g., selecting residents living in the neighbor-

hood undergoing a heat transition). Data collection through interviews continued until saturation was reached, which occurred at twenty-one (n=21) interviews.

A semi-structured interview protocol guided the conversation to ensure consistency while allowing flexibility to explore emergent topics. Questions focused on experiences with the heat transition process, perceptions of the role of various actors, and personal and collective tensions encountered during heat transition processes. For the interview protocol see Appendix D.

Field notes included field observations of door to door conversations with residents and on-site observations of heat transitions endeavors in the selected neighborhoods.

Publicly available policy *documents*, reports and planning documents related to the selected neighborhood transitions were included to contextualize the dynamics and logics observed in interviews and on site observations, and to link the local experiences to broader governance and policy frameworks. Besides, they were used to contextualize and understand the formal narratives and strategies related to local heat transitions, which influence the transition process.

Table 4.2. Overview of primary and secondary data sources

	Data sources		
Selected cases/neighborhoods	Interviews	Field notes	Documents
Nijverheid (municipality of Hengelo)	8 consisting of: Municipality (1), Residents (5), Housing corporation (1), Intermediary (1).	Fieldnotes on-site observations	Project reports year 2019 & 2020 (of when the project started) & national policy reports 2024
Pendrecht (municipality of Rotterdam)	8 consisting of: Intermediary (4), Residents (3), Housing corporation (1).	Fieldnotes on-site observations	Project reports year 2019 & 2020 (of when the project started) & national policy reports 2024
Brunssum Noord (municipality of Brunssum)	5 consisting of: Municipality (1), Intermediary (1), Residents (1), Heat provider (1), Housing corporation (1).	Fieldnotes on-site observations	Project reports year 2019 & 2020 (of when the project started) & national policy reports 2024

4.3.4 Data analysis

For the data analysis, we employed an inductive thematic approach. This approach is particularly helpful for exploratory analysis of complex multi-actor settings where dynamics are not always well-defined or previously theorized (Azungah, 2018). Our analysis proceeded in two steps.

First, we conducted an empirical mapping of tensions through an initial open-coding cycle. Using the coding software Nvivo, we systematically examined the data

to identify key statements, narratives, justifications and actions articulated by the various actors, without imposing predefined categories. Through this open coding, we were able to empirically map and identify the main themes around which tensions emerge that contribute to deadlocks or conflicts in neighborhood level heat transitions.

Building on this empirical mapping, we developed an analytical framework to interpret and explain these dynamics through the lens of relational acceptance and institutional logics. To operationalize institutional logics, we examined the expressed rationalities in the data, such as normative arguments, references to rules or standards, value laden language and framings of legitimacy or appropriateness, to reveal the underlying meaning structures guiding actors' interpretations and (inter)actions. These rationalities were coded and clustered to identify distinct logics shaping both conflicts and alignment in heat transition contexts, offering deeper insights into why tensions exists. In naming and defining these logics, we aimed to avoid a crude 'boxing exercise' that would simply sort data into generic or overly broad categories (like e.g., 'market logic' or 'governance logic'). Instead, we sought to capture the nuances and contextual specificities of actors' reasoning by staying as close as possible to the wording, practices and meanings expressed by the actors themselves. This meant analyzing not only what actors said, but how they framed problems, justified choices and articulated priorities. While existing theoretical notions of institutional logics served as a sensitizing concept, the identification and labeling of specific logics emerged inductively from the data and were continuously refined and compared across cases through critical discussion among the research team, ensuring analytical consistency. The goal was to ensure that the logics reflected empirical realities rather than imposing theoretical labels that might obscure important nuances.

Through this process we were able to gain a more nuanced understanding of tensions and conflicts within and between actor groups, as well as instances of emerging hybridization, helping to clarify how different tensions and logics interact. We specifically focused on identifying where tensions occurred, between which actors, and the underlying reasons for these conflicts, ensuring that these tensions were conceptually comparable across cases. A full list of identified logics with illustrating quotes can be found in Appendix F.

4.4 Results: key tensions in Dutch heat transitions

In this section we describe five dominant themes around which tensions emerge in neighborhood heat transitions, specifically in vulnerable neighborhoods (see Figure 4.1). These themes characterize and reveal critical points of tension between actors. The results are structured around these themes, starting with the most general and gradually narrowing down to those that are increasingly specific and

impactful for vulnerable neighborhoods. Within each theme, we identify the key tensions and map the wide range of logics enacted by different actors. This allows us to pinpoint where misalignments or alignments occur, and to trace how these logics emerge both within actor groups and in their interaction with each other. By doing so, we reveal how individuals relate to collective dynamics and how tensions and possibilities for alignment manifest both within and between actors. Importantly, results show that these tensions do no revolve directly around technology; they emerge around deeper social and institutional dynamics (e.g., participatory approaches, urgency and funding). Furthermore, actors do not operate according to a single, fixed logic. Instead, they adopt different logics across themes, leading to shifting alignment possibilities and conflicts. By mapping these logics per actor and per topic, we provide a view of the relational dynamics at play and identify where potential leverage points for advancing the heat transition may lie.

Figure 4.1. The dominant themes identified around which tensions emerge in neighborhood heat transitions

4.4.1 Neighborhood approaches in heat transitions

A prominent theme that emerged from the data concerned tensions around the conceptualization and operationalization of the neighborhood approach itself. As outlined in the introduction, policy makers in the Netherlands have increasingly shifted away from placing sole responsibility on individual households to drive energy transitions. Instead they have emphasized coordinated, larger-scale interventions, partly in response to growing network challenges such as congestion.

This shift has elevated neighborhood-level strategies to a central focal point in heat transition efforts. Table 4.3 provides an overview of the main tensions, actors and logics around neighborhood approaches in heat transitions.

4.4.1.1 Diverging political ideologies and capacities among local authorities

Findings show that the interpretation and implementation of the neighborhood approach varied considerably across actor groups, particularly among local authorities tasked with the execution of those strategies. Whereas national authorities tended to adopt a *collective coordination logic*, local authorities held more heterogenous views. In practice, neighborhood approaches were variably understood as either 1) centralized heat networks connecting entire neighborhoods to a collective heat source, or 2) individual-level, neighborhood-wide heat solutions, such as heat pumps and insulation. Divergent understandings reflected different underlying logics among actors giving rise to tensions.

Across local authorities, we observed substantial variation in the logics guiding decisions about neighborhood approaches. A key distinction concerned how municipalities interpret the government's role, often reflecting divergent political ideologies. Some municipalities adhered to a *logic of social or institutional responsibility*, and therefore favored collective heat solutions. They argued that collective systems reduced the burden on individual residents, avoid leaving anyone behind, and simultaneously ensured the technical viability of the grid. These actors also warned that extensive reliance on individual solutions could exacerbate grid congestion. Notably, concerns about the risk of dependency on a single provider were often seen as secondary to these collective benefits. As municipalities described:

> Well look, if you have D66/VDD in a coalition, the more liberal side so to speak, they think freedom of choice is a really important ideal. Whereas if you have a more left-oriented or left wing coalition,[...] like GroenLinks/SP, yes then unburdening, helping, and not leaving anyone behind is way more central. – municipality

> A private owner is responsible for his own home. They have to take care of everything themselves in the basics. But the advantage of heat networks is that you can unburden way better as a municipality, because you organize it collectively. – municipality

In contrast, another municipality adhered to a *logic of individual autonomy,* and argued that it is not the governments' role to prescribe specific solutions. This actor emphasized individual consumer choice and freedom for residents to determine the best (market) heat solutions for their homes. As one municipality described:

> You do not want to be the government that determines everything and say: you have to do it. Especially if it is going to involve your [residents] own money. What you want is that a group of local residents starts working together to find the best solutions for their own house. – municipality

Importantly, findings indicate that these divergent logics were shaped not only by political ideology (social responsibility versus individual autonomy), but also by institutional capacity. Larger or better-resourced municipalities seemed better equipped to pursue collective solutions, whereas smaller municipalities seemed to favor individual approaches, that could be more left to citizens. As one municipality explained about building capacity for collective heat transition implementation:

> We have now tried to make it [neighborhood plans] a bit more concrete so we can actually get to work. And with that, together with the process managers within the municipality, we have several process managers [...] so we are expanding quite a bit, growing as a team, [...] So I think the ingredients are now there to start taking some steps. – municipality

4.4.1.2 Divergent housing situations between homeowners and tenants

Beyond municipal differences, we also observed substantial divergence between homeowners and tenants regarding their preferred heating solutions. These differences reflected underlying tensions within neighborhoods, as resident groups held diverging preferences shaped by their housing situation and associated responsibilities. Individual solutions, such as heat pumps, were often considered more attractive, as they typically required little or no accompanying insulation upgrades. Residents also valued the autonomy these solutions enabled to maintain, particularly the ability to maintain flexibility in choosing or switching energy providers, an important consideration given concerns about price increases and risk of being locked into a single supplier. This reflected both a *consumer control* and an *anti-monopolistic logic*. As one intermediary described the response of residents to heat networks:

> You can tell people ten or twenty times that ninety percent of this whole heat transition project is subsidized... But they do have a point.. that they do end up being tied to one party [heat provider] where we do not know what prices are going to do in the future. – intermediary

In one neighborhood, residents favored individual solutions because they allowed them to adapt to anticipated advanced technologies in the future, reflecting an *evolutionary market logic* and *flexibility logic.*

> In 20 years, the world will look completely different, with completely different developments. So yes, hybrid is a temporary solution, we agree with that, but in 15 or 20 years, we'll look at the knowledge and options available then. In the meantime, you've already reduced gas use by 70%. And if we had tackled this in 2018, we would've been done by 2020. – residents

By contrast, collective solutions such as heat networks, differ substantially depending on whether they operate at high or low- temperatures. High-temperature networks generally require less insulation to ensure adequate heat delivery, whereas low temperature networks necessitate substantial insulation upgrades to function effectively. The implications of these technical requirements were particularly salient in socio-economically vulnerable neighborhoods, where housing stock was often poorly insulated or maintained, and diverged considerably for homeowners and tenants. For homeowners insulation costs represented significant upfront financial responsibilities, while tenants are not directly accountable for these costs. Consequently, affordability was interpreted differently across these groups, producing overlapping, yet distinct *affordability logics.* While both homeowners and tenants expressed concerns about long-term energy price stability, homeowners also considered the upfront financial burden of modifying their home to make it compatible with collective systems. One intermediary highlighted these challenges for homeowners, particularly for those with limited financial capacity.

> Only, you also [apart from the connection fee] have to do some work inside the homes, and for that, as a homeowner, you have to take care of it yourself. There are loan arrangements for this, interest-free loans that you can spread out over a maximum of 10 years [...] but there's an age limit and also a credit check (BKR check). So the moment you already have debts... that's what I still see as one of the flaws in the system... You want to make a loan possible for the most vulnerable groups, but they often already have debt arrangements or something similar. So in fact, you end up excluding precisely the people you're trying to help. – intermediary

4.4.1.3 Diverging costs responsibilities between residents and authorities

Lastly, a fundamental divergence in logics around costs responsibilities emerged between local authorities and residents, when considering individual versus collective solutions. Local authorities often operated from a *social cost responsibility logic*, emphasizing the minimization of broader and long-term societal costs associated with the energy transition. They expressed the concern that widespread individual electrification solutions (e.g., heat pumps) would overload the electricity grid, necessitating substantial infrastructure upgrades and incurring significant societal costs. These costs were viewed as societal burdens that governments were responsible for managing.

> And I am sure, really 100% sure, that if everyone chooses the lowest cost for their own situation that it [heat transition] will be much more expensive nationally than if we choose the lowest social cost situation. And that may indeed mean for some that it is indeed more expensive, so to speak, so not lowest cost for every individual per se, but ultimately lowest cost for society and that's where the tension lies, isn't it? People just want the cheapest situation for themselves, and as governments we want the cheapest situation for everyone. – municipality

Residents, by contrast, followed a *private cost responsibility logic,* focusing primarily on their personal upfront investments and monthly expenses. Because societal costs were not reflected in the price of individual solutions, these options were often perceived as cheaper. This was particular salient in vulnerable neighborhood, where affordability was a key concern. These contrasting logics reflected a deeper underlying tension about who bears the costs of heat transitions: authorities prioritized system-wide costs efficiency, whereas residents emphasized financial viability at the individual level.

Around this neighborhood-approach theme, a core source of friction lay in the multitude of diverging logics and the non-uniformity of actor groups, especially how they interpret, operationalize, and prioritize the neighborhood approach. For example, municipalities differ in political ideology and institutional capacity, while residents are fragmented along lines of ownership status and affordability concerns. Together, these interrelated sources of friction complicate coordination at the neighborhood-level, where the neighborhood approach functions less as a unified policy framework, and more as a contested arena. The coexistence of multiple logics within and across actor groups creates conditions that may hinder alignment, illustrating how friction emerges from the diversity of logics and underscoring the complexity of collective decision-making in this context.

Table 4.3. Main tensions, actors and logics around neighborhood approaches in heat transitions

Main tensions	Actors	Logics
Tension 4.1.1: Diverging political ideologies and capacities among local authorities	National authorities	Collective coordination logic
	Some local authorities	Social or institutional responsibility logic
	Some local authorities	Individual autonomy logic
Tension 4.1.2: Divergent housing situations between homeowners and tenants	Residents in general (homeowners & tenants alike)	Consumer control logic Anti-monopolistic logic Evolutionary market logic
	◦ Homeowners specific	Affordability logic extended
	◦ Tenants specific	Affordability logic
Tension 4.1.3: Diverging costs responsibilities between residents and authorities	Some local authorities	Social costs responsibility logic
	Residents	Private costs responsibility logic

4.4.2 Participation in heat transitions

Within the broader tensions surrounding neighborhood approaches, a second major theme concerned participation strategies in neighborhood heat approaches. Especially in more vulnerable neighborhoods different rationales for participation collided, creating new tensions or reinforcing deadlocks. In most neighborhoods, participation was initiated and structured top-down by local authorities, although in one case participation developed bottom-up. Across cases, we could observe two types of participation strategies, each associated with different underlying logics. Table 4.4 gives an overview of the main tensions, actors and logics around participation in heat transitions

4.4.2.1 Diverging participation rationales

Municipalities frequently adopted what they described as an unburdening approach. In these strategies, residents were not expected to actively contribute ideas, instead, they were offered a pre-determined option designed by involved parties (e.g., housing corporations, heat suppliers, and municipalities). Unburdening approaches were grounded in the rationale that, especially in more vulnerable contexts, residents already faced multi-problems and are already over-asked with engagement requests. Requiring extensive participation was therefore seen as unrealistic and potentially unfair. In this framing, residents should be shielded from excessive demands and provided with a simple, comprehensible choice (requiring a simple yes or no answer), reflecting a *protection or care logic*. With this, authorities aimed to reduce the risk of people being left behind by vulnerability mitigation and preventing residents from having to figure out everything out on their own. As one housing corporation illustrated this rationale:

> But if four out of five of their problems are something other than energy and so on, then of course it makes sense, if the fridge is empty, if the kids can't read, if they're being beaten up by their partner, so to speak, then they have completely different issues. You can't expect anything from those people. You really need to unburden them, support them, and you should offer them something. An offer they can't refuse [...]. – housing corporation

However, this care logic created tensions when applied unevenly across different resident groups. Tenants could be fully unburdened, as landlords or housing corporations were responsible for decisions around for example renovations and heat solutions. Homeowners, by contrast, remained responsible for these aspects themselves (e.g., arranging insulation and renovations, applying for subsidies to partially cover costs, and securing loans when needed). This was particularly challenging for low-income homeowners (e.g., those in social ownership 'sociale koop'), an often-overlooked group. As a result, the notion of "unburdening" carried differ-

ent meanings for different groups, and in practice, some could be unburdened far more than others.

In contrast to the unburdening approach we also observed approaches where residents were actively approached to think along to some extent about the optimal heat solution for their neighborhood. Here, participation was not framed primarily in terms of democratic legitimacy, but rather as a *risk minimization logic*: participation was seen as instrumental for increasing trust or the bond between government and residents, acceptance and efficiency in decision-making, and thus reduce costs of implementation. As one local authority shared about their participation approach:

> What you want is for a small group of local residents to eventually start working together to figure out what the best solution is for their homes. And that's really why we choose to let residents experience it for themselves. Because the moment they realize for themselves, "this is the only solution," or "this is one of the few viable options," that's when you start to build support. – local authority

Another local authority described how this instrumental approach played out in practice:

> And then I think it was a bit like: we [municipality] already have a preference, and we presented it in such a way the hope was that the residents would embrace it too [...] that they'd come up with the same idea, haha. – local authority

Across these different rationales, tensions emerged not only around whether resident should participate, but also when, how, and to what extent they should be involved. These differences reflected diverging logics from both governments and residents, often leading to clashes in expectations and interpretations of the participation process.

4.4.2.2 Diverging timings of and in participatory approaches

Municipalities struggled with the timing and format of participation, especially in the context of heat network development. When participation was initiated too early, before important conditions were clear, or when authorities took too long to clarify those conditions, residents' support became difficult to secure. Yet, greater participation often tended to reduce costs by strengthening the business case for collective solutions such as heat networks. Authorities therefore faced what we interpret as a chicken-and-egg dilemma: clarity depended on participation, but meaningful participation depended on the provision of clarity.

> But the residents really wanted to know: "What are you going to do?" And we couldn't really give an answer, because the Council didn't want to make a decision on it, and neither did the bench of Mayor and Alderman (college). Yes, then at a certain point you run out of communication material. – municipality

> I think that if you are really talking about homes, then you almost have to approach it at the neighbourhood level. It is just... either at the neighbourhood level or with high-rise buildings, a few objects close together, because otherwise it might not become profitable. [...] Some consultation is also needed in these cases, [...] as it has impact on whether the parties can still offer it profitably. – heat provider

As a result, many residents acted according to a *decision uncertainty logic,* entailing hesitation and delayed action, because responsibilities were unclear and decisive guidance from authorities was lacking. This logic was amplified in home-owners associations (VVEs), where collective action was required but difficult to achieve. Here, decision-making-processes were delayed or obstructed by a *prisoners dilemma logic:* individual homeowners often chose inaction or pursued individual strategies because benefits depended on collective uptake and others' decisions remained unpredictable. At the same time, and related to this, the uncertainty logic emerged as a consequence of *bureaucratic logics* within and between institutions. Slow internal institutional processes, such as interdepartmental coordination, established democratic procedures, differing bureaucratic timelines between key stakeholders (e.g., housing corporations, heat providers and municipalities), and unforeseen circumstances constrained what authorities could communicate. These bureaucratic dynamics often failed to align with residents' lived realities, expectations, or needs, further intensifying the participation dilemma. The challenge of coordinating and integrating multiple actors and issues simultaneously proved difficult and intensified the participation dilemma.

4.4.2.3 Diverging democratic engagement logics in participatory approaches

A further tension concerned the perceived democratic legitimacy of participation. Within municipalities, we observed competing logics shaping how political actors engaged with residents. On the one hand, politicians tended to follow a *political sensitivity logic*, prioritizing responsiveness to vocal and organized residents to avoid backlash or loss of political support. This could smooth project implementation by keeping engaged and vocal groups on board. On the other hand, these vocal participants did not always represent the broader community, especially in vulnerable neighborhoods where many residents remained disengaged due to social challenges or low trust. As such, privileging vocal groups risked undermining representativeness and marginalizing quieter voices, revealing tensions between *pragmatic political logics* and *representativeness logics,* as illustrated in the following quote:

> Well, part of our problem was that they [neighborhood committee] kept saying they were speaking on behalf of the neighborhood, and we thought: yes, but you're a group of men over seventy, all white. You are not the neighborhood! – municipality

4.4.2.4 Diverging epistemologies in participatory approaches

A third tension emerged around the status and legitimacy of knowledge in participatory processes. In one case, the municipality invited residents to contribute ideas and perspectives, following a *transparency logic* aimed at fostering trust and acceptance. Some residents responded with an *agency logic*, conducting their own research into heating solutions and presenting alternative proposals. As these resident-generated knowledge claims entered the discussion, an epistemological conflict emerged. Local authorities questioned the reliability or neutrality of residents' research, while residents challenged the completeness and objectivity of the municipality's information. What began as an inclusive transparency-driven process thus shifted toward a conflict over what counted as valid knowledge (*incomplete knowledge logic*). This conflict led the municipality to reconsider how open future participation processes should be, prompting greater caution about what forms of input residents could meaningfully provide. Residents, in turn, began acting on a *strategic mobilization logic*, using their findings to mobilize political actors and neighbors to ensure they were heard and their knowledge considered. It was in this context that bottom-up forms of participation emerged.

Across these cases, deadlocks emerged from the dynamic interplay of competing and often conflicting logics around participation. The enactment of one logic by an actor did not occur in isolation and influenced how others interpreted the situation, prompting them to adapt or reorient their own logics in response. Tensions therefore arose precisely through these reciprocal interactions, creating a feedback loop in which one's logic enactment triggered or amplified opposing or alternative logics among others. For instance, when authorities enacted a transparency logic, it heightened residents' sense of agency, which in turn led to an epistemological conflict that deepened mistrust and activated a strategic mobilization logic among residents, ultimately obstructing collective progress. In this way, deadlocks were produced through the ongoing, relational interactions of divergent logics rather than through isolated logics alone.

Table 4.4. Main tensions, actors and logics around participation in heat transitions

Main tensions	Actors	Logics
Tension 4.2.1: Diverging participation rationales	Some local authorities	Protection or care logic
	Some local authorities	Risk minimization logic
Tension 4.2.2: Diverging timings of and in participation approaches	Residents	Decision uncertainty logic
	Residents (VVEs)	Prisoners dilemma logic
	Local authorities, housing corporations, heat providers	Bureaucracy logic
Tension 4.2.3: Diverging democratic engagement logics in participatory approaches	Some local authorities	Political sensitivity logic
		Representativeness logic
Tension 4.2.4: Diverging epistemologies in participatory approaches	Some local authorities	Transparency logic Incomplete knowledge logic
	Residents	Agency logic Strategic mobilization logic

4.4.3 Privatization of energy access in heat transitions

A central source of tension across cases was the ongoing privatization of energy provision and its implications for access to heat. This theme closely linked to decisions about the neighborhood approach and resident participation, and became particularly salient when heat networks were proposed. Table 4.5 provides an overview of the main tensions, actors and logics around privatization in heat transitions.

4.4.3.1 Diverging infrastructure responsibilities over time

In several cases, heat-networks were proposed as a key solution for shifting multiple households from natural gas to more sustainable heat sources. These networks could efficiently connect multiple households to a centralized heat supply, thereby reducing reliance on individual heating systems. However, unlike the electricity market, which typically features multiple competing providers, heat networks typically rely on a single provider because of the dedicated infrastructure required that limits the feasibility of accommodating multiple suppliers. This dependence raised particular concerns in more socioeconomically vulnerable neighborhoods, where reduced consumer choice and increased dependence on a single provider were perceived as potentially deepening existing vulnerabilities.

In contrast to the publicly financed and centrally coordinated roll-out of the natural gas network, contemporary heat networks are largely market-led. Interviewees emphasized that heat providers were now responsible not only for producing heat but also for financing and constructing the distribution infrastructure, but without the level of public subsidy that enabled earlier energy transitions. Providers often invoked a *historical fairness logic* to explain the tension around increased infrastructural responsibilities. One heat provider reflected:

> We now need to put a transmission grid there. After that we have to build a power plant there and a distribution grid to all those homes. Connection costs...? We are not subsidized, so somebody's going to have to pay us, right? [...] that is actually the warped fact about the current system... if you look at the 1970s, 1960s, natural gas was found in Slochteren, right? Who built the gas lines then?! That was all subsidized by the government! – heat provider

These increased infrastructure responsibilities introduced new dynamics. Because providers needed a critical mass of committing households to make a heat network financially viable, they were willing to proceed only when enough residents agreed in advance. Poorer neighborhoods, often with older, poorly insulated homes, often showed strong potential for integrating heat networks, especially combined with necessary renovations. Yet, this *economic viability logic* created tensions precisely in these areas: low-rise and older buildings generally carried the highest unprofitable costs (unprofitable top). They were often more difficult and expensive to connect due to poor insulation and limited space for larger installations. Providers argued that these additional investments could not be recovered within normal business models, generating financial gaps that made such areas less attractive for providers to develop. As one provider explained:

> For us it is important: are there enough further outlets in that area? Because we have to lay a transmission grid in that direction, and that is just not profitable for one customer [...] connecting low-rise buildings so to speak, that is mainly where the costs are [...] Plus the fact that those old houses often don't have the space [....] there lies also a big problem there, those contexts often have a unprofitable top that has to be taken off. – heat provider

4.4.3.2 Diverging notions of cost distribution

In practice, we observed that the rising investment costs were frequently, whether implicitly or explicitly, used to justify the redistribution of financial burdens onto end-users (particularly residents). This *burden shifting logic* was not always formally acknowledged, but is was widely perceived by various stakeholders, and felt particularly impactful in vulnerable communities. Housing corporations, for example, were expected to absorb increased costs, which may ultimately be passed on to tenants. One housing corporation articulated this clearly:

> If we pay for those costs, what do we pay that from... that is tenants' money! Every euro we put into closing their [heat providers'] business case, we cannot put into insulation, we cannot put into renovation,...I will name a few [...] and about that we say: that does not make sense, then you are putting the bill of the heat transition down to the poorest tenants in the city, and we are not going to do that. – housing corporation

These different logics gave rise to tensions between residents and market actors, specifically in heat network exploration contexts. Residents often perceived current or anticipated future heat prices as unfair, a concern amplified by the regulatory framework of the Dutch Authority for Consumers and Markets (ACM). Although ACM regulations set a legal cap on what heat providers may charge, both residents (and representatives) viewed the pricing mechanisms as opaque, and in many cases, excessively high. This perceived lack of institutional safeguards to prevent these practices and perceived unfairness activated a *fairness and accountability logic* among residents, eroding trust in both market providers and regulatory authorities and contributing to tensions between residents and (local) authorities.

4.4.3.3 Diverging notions of ownership and control in heat networks

The structural dependence on a single heat provider further intensified concerns. The interplay of institutional regulations, limited viable alternatives, and a perceived lack of consumer choice contributed to a widespread feeling of energy monopolization among residents. This *anti-monopoly logic* fueled resistance in several cases, shaping whether residents were willing to support the introduction of heat networks. As one resident expressed this sentiment:

> Fieldnote Nijverheid: the resident that opened the door said not to want to talk about it [heat transition in neighborhood] much. The only thing she wanted to share was that she had the feeling that the heat network was pushed down the throat and she did not want that.. because with that you would only have one provider, so that would be a disadvantage because of the limited providers choice.

Similarly to the previous section, tensions around privatization emerged from the interplay of multiple logics between and within actor groups. The enactment of one logic often triggered a chain reaction, prompting others to adopt or reinforce different logics in response. For example, when heat providers enacted an economic viability logic, housing corporations responded by adopting a burden shifting logic. This illustrates how logics were not static but continuously shaped and reshaped through encounters between actors. Interestingly, we also found that different actors sometimes drew on similar logics. For example, both market actors and residents appealed to notions of fairness. While this shared reference suggested potential openings for mutual understanding, significant power asymmetries complicated how fairness arguments were perceived and validated. Although their interpretations of fairness diverged, the shared reference to fairness logics offers potential entry points for dialogue and negotiation, and with that, possible synergies in advancing heat transitions.

Table 4.5. Main tensions, actors and logics around privatization in heat transitions

Main tensions	Actors	Logics
Tension 4.3.1: Diverging infrastructure responsibilities over time	Heat providers	Historical fairness logic Economic viability logic
Tension 4.3.2: Diverging notions of costs distribution	Residents & housing corporation	Burden shifting logic
	Residents	Fairness and accountability logic
Tension 4.3.3: Diverging notions of ownership and control in heat networks	Residents	Anti-monopoly logic

4.4.4 Urgency in heat transitions

Across cases, urgency itself emerged as a source of tension, shaped by different and sometimes conflicting logics. While not directly tied to the previous themes, or resulting from them, urgency played a particular role in vulnerable neighborhoods. Several logics emerged as conceptually dominant around the topic of urgency. Table 4.6 provides the main tensions, actors and logics around urgency in heat transitions.

4.4.4.1 Diverging sense of priorities between authorities and residents

In disadvantaged neighborhoods, residents often enacted *survival priority logics*. Although they needed urgent heat solutions the most, collective neighborhood approaches frequently failed to address their broader and more pressing concerns. Immediate concerns such as poor housing conditions, unemployment, financial stress or health issues often made quick fixes more attractive and took precedence over long-term sustainable heating solutions. Promises of future affordable and sustainable heat seemed less compelling than the need to get through day-to day structural issues, leading to resistance or hesitation towards (collective) heating solutions. This resident logic clashed with a *long-term rational planning logic* enacted by governments and other actors, who emphasized long-term, cost-effective solutions, such as heat networks, as inherently beneficial, but did not address immediate needs or structural issues residents faced. As one intermediary explained:

> Because, for example, the offer of €1,500 is a good deal, but for many people it's still a lot of money, especially here in Pendrecht. There's a large group here, what they call "social buyers", who just barely managed to buy a home back then. They simply have zero mental space to even start thinking about this. – intermediary

> But still, even if it were free, many people just don't have the mental space for it. They're just glad if they can afford to eat at the end of the week. – intermediary

Another emphasized authorities' long-term reasoning:

> So it's already heavily subsidized [heat network], and look, if you spread it out over 10 years, €1,500 without interest, you're talking about ten euros a month, right? – intermediary

4.4.4.2 Diverging sense of implementation priorities among authorities

A *political logic* also shaped urgency within governmental institutions and local politics. Decisions in the PAW cases were often influenced by short-term accountability pressures (e.g., election cycles and climate change goals). This logic prioritized visible and preferably rapid implementation, enabling politicians to demonstrate progress within their term. However, this emphasis on speed often came at the expense of the *integrative logic* needed for long-term, multi-dimensional neighborhood improvements, such as health, unemployment and insulation. As one housing corporation explained about the political accountability logic they saw among the municipality they worked with:

> The term for Alderman is four years and sometimes it's two or three times four years. But after four years, they either have to have achieved something, get re-elected, or step down. That doesn't make them suspicious in the sense of doing anything wrong, but it's entirely understandable that if you keep working the way you do, it's not exactly conducive to achieving long-term results. – housing corporation

The same interviewee highlighted how political responsiveness overshadows long-term vision:

> What do you think... do you really think an Alderman is going to say, "We're not going to do anything for your neighborhood anymore, dear electorate"? Of course not. They'll look for ways to help those people anyway. If I were an alderman, I'd do the same. I wouldn't let anyone down. I'd look at what I can do for you, right? But that has nothing to do with vision. – housing corporation

Here, urgency was framed not as a response to structural needs but as a political imperative to show results quickly.

4.4.4.3 Diverging execution priorities among housing corporations

Within housing corporations a *compliance logic* increasingly replaced earlier practices grounded in a *synergy logic*. Previously, energy renovations were aligned with other necessary maintenance work (e.g., insulation, facade repairs, painting), to reduce disruption and make it more attractive for residents to participate or support. However, growing pressure to meet 2050 climate goals shifted priorities: stricter deadlines pushed corporations to focus on rapid compliance rather than integrated improvements. This resulted in missed opportunities to improve overall living

conditions while addressing heat transition needs. One housing corporation explained this shift:

> The big difference from how we used to do things is that we always combined it with a full renovation. And you can see that when we do that, we manage about 800 homes per year. Well, we have 50,000 homes, and 20% has been done, so we still need to do 40,000. That means we'd need to do around 1,400 to 1,500 homes per year if we want to stay on track for 2050. That's almost double. So it's not realistic to always link the heat transition to a full renovation. In these area-based approaches, we now really need to focus much more on just the heat transition itself, basically, to put it very simply: remove the boiler, bring in the new pipework, install the delivery set, and figure out how to still make a decent offer to the resident in that context. – housing corporation

The quote illustrates the tension between two competing urgencies: meeting regulatory deadlines and necessity of up-scaling (compliance) versus addressing multiple needs in an integrated, more resident-centered, way (synergy).

4.4.4.4 Diverging market logics and investment landscapes

A *market or investment logic* further shaped how urgency was operationalized, particularly in relation to the development of heat network business cases. Wealthier neighborhoods, with better-insulated homes and fewer pre-existing maintenance issues, offered more favorable investment conditions. In contrast, poorer neighborhoods often contained older, poorly maintained housing, requiring costly upgrades before collective heating could function effectively, particularly when low-temperature systems were planned. This created a paradox of misaligned incentives: the area's most urgently in need of energy solutions and improvements were the least attractive to invest in, while the easiest areas to transition were often the least urgent from a social perspective.

Taken together, the deadlocks around urgency arose because each actor group prioritized different time horizons and outcomes: residents emphasized immediate survival, politicians sought short-term visibility, housing corporations prioritized regulatory compliance, and market actors weighed financial viability. These misalignments demonstrate that urgency is not a neutral concept, but interpreted, enacted, and operationalized differently across actors. As such, urgency became a contested site of negotiation, shaping whose needs were addressed, whose timelines dominated and what was considered an appropriate investment of time and resources. These divergent interpretations created conditions for tensions and resistance, especially in vulnerable neighborhoods, and complicated efforts toward just and inclusive heat transitions. Moreover, results showed that logics were not fixed. They shifted over time and in response to changing contexts. Actors' log-

ics evolved both through interactions with others (as seen in previous sections), under external pressures, changing contexts, and simply over time. For instance, housing corporations that initially operated from a synergy logic gradually adopted a compliance logic as regulatory demands and timelines intensified.

Table 4.6. Main tensions, actors and logics around urgency in heat transitions

Main tensions	Actors	Logics
Tension 4.4.1: Diverging sense of priorities	Residents	Survival priority logic
	Some local authorities & other actors	Long term rational planning logic
Tension 4.4.2: Diverging sense of implementation priorities	Local authorities	Political logic
		Integrative logic
Tension 4.4.3: Diverging execution priorities	Housing corporations	Compliance logic
		Synergy logic
Tension 4.4.4: Diverging market logics and investment landscapes	Heat providers	Market or investment logic

4.4.5 Funding allocation in heat transitions

Decisions about how and where to allocate money in heat transition projects revealed competing logics that shaped both the perceived fairness and the practical outcomes of neighborhood approaches. Table 4.7 gives an overview of the main tensions, actors, and logics around funding in heat transitions.

4.4.5.1 Diverging money distribution approaches

First, an *equality logic* was visible in standardized financial models, particularly in the two cases where heat networks were explored. In both cases, there were fixed connection fees for all homeowners (1500 euros), intended to treat all residents the same. However, this approach clashed or overlooked an *equity logic* which argued that differences in financial capacity and responsibility should be considered. For example, tenants typically relied on housing corporations to cover upgrade or connection costs, while homeowners (particularly those in 'social ownership' housing) carried a heavier financial burden often without the means or willingness to take on loans or navigate complex subsidy schemes. This reflected a distributional justice tension between standardized and need-based allocation of money. One intermediary illustrated this tension, noting how the standardized fee overlooked large differences in household capacity:

> Of course, this is what makes the issue so difficult, or at least what often gives me a stomachache: that €1,500 and the intent letter that had to be signed. Well, that was signed without hesitation by many people who could easily have paid more, who understood the whole picture and were perfectly capable of arranging things themselves. And these are often the same people receiving subsidies, you know, the ones whose homes are already well insulated and who really

> have everything under control. So yes, it remains really tough. Sometimes I think: couldn't we have just asked you to pay €3,000, so that someone else could get it for free? – intermediary

4.4.5.2 Diverging everyday investment realities

A second layer of tension emerged from everyday energy-use realities and housing conditions, which shaped both the perceived and actual feasibility of investing in sustainable heat solutions. Poorly insulated homes left little room to reduce energy use, while households that underheated, often due to poverty rather than choice, saw little personal return from investing in (upfront) expensive sustainable solutions. This revealed the co-existence of different logics at the basis for investment considerations: *cost-benefit logics* (will it pay off) and *capability logics* (can one act at all). Age added further complexity: older residents were often motivated to support transitions, but unlikely to recoup their investment within their lifetime. A municipal official described how underheating distorted energy reduction statistics while masking severe financial strain:

> Just to give you an idea, the goal set in the Heat Transition Vision is to reduce natural gas consumption by 20% in all of Brunssum by 2030. But we actually already reached that last year, 22% reduction, even. And as a municipality, you could really pat yourself on the back and say, "Oh, we're doing great"... but that's mainly because people are simply too afraid to turn on the heating due to the high gas prices. [...] This week I spoke to someone who said, "You can come visit me, but you'll have to wear a coat, it's cold here." They don't have the heating on at all. [...] They're not heating their home, because the costs are just too high. – municipality

Housing corporations observed similar patterns:

> I personally called a few people in Pendrecht. It just so happened they all lived in an older housing complex, and the first three basically turned me down over the phone. And the others said the same, number three, for example, said, "I don't heat my home," and added, "I'm spending less than fifty euros a month on everything." – housing corporation

Local authorities emphasized that reluctance was not about unwillingness but about feasibility:

> So it's not that there's unwillingness, but rather: how on earth are we going to pay for this? – local authorities about residents visits

4.4.5.3 Diverging money allocation approaches

Third, a *capacity building logic* became visible in how transition funding was allocated. In many pilot projects, a substantial share of public funding was directed towards developing process infrastructure, like hiring consultancy, coordination, research and participation design. This was especially apparent in smaller municipalities with limited organizational capacity or in-house expertise. Investments therefore often focused on establishing a solid procedural foundation and building capacity for implementation. An intermediary reflected critically on these dynamics:

> Last year there was an article in de Volkskrant titled something like, "Oh yes, all those municipalities hiring all those consultancy firms," and I thought to myself, yeah, that's true, and I totally agree, please don't hire us. But it's also because... it's not just about time, as is often said, it's also simply about a lack of courage or something like that. It's not easy to stand up and change things within a system like this. – intermediary

However, this emphasis on capacity building, could come at the expense of direct redistribution of money to residents, creating a tension between investing in governance capacity, and investing in direct social benefits by using funds to directly address inequalities, which follows a *redistributive logic*. It showed a dilemma centering on whether public funding should primarily enable smooth procedural transitions or directly be used to balance social disparities in the outcomes of these transitions.

Taken together, these findings showed more than just conflicting priorities. They revealed a deeper structural mismatch between the financial design of heat transitions and the everyday realities of affected communities. These coexisting logics were not merely different but often incommensurable, offering fundamentally incompatible answers to what counts as fair, feasible, or urgent. The resulting funding deadlock reflected a broader institutional struggle to reconcile procedural effectiveness with distributive justice and socio-economic reality.

Table 4.7. Main tensions, actors, and logics around funding in heat transitions

Main tensions	Actors	Logics
Tension 4.5.1: Diverging money distribution approaches	National and local authorities	Equality logic
	Local Intermediary	Equity logic
Tension 4.5.2: Diverging everyday investment realities	Residents	Cost-benefit logic Capability logic
Tension 4.5.3: Diverging money allocation approaches	Local authorities	Capacity building logic
	Local Intermediary	Redistribution logic

4.5 Discussion

In this section, we reflect on the implications of our findings by unpacking the emergence of tensions in neighborhood-level heat transitions and identifying potential leverage points to address, navigate, and overcome these tensions in practice. By examining how actors and their embedded logics shape everyday practices, we first identify two interrelated sources of misalignments that lie at the heart of stagnation in collective heat transition: one rooted in divergent meaning structures (content), the other in insufficiently nurtured interpersonal dynamics (relations). We then show how these misalignments give rise to three potential leverage points that can support more constructive collective processes. These potential leverage points are understood as places where targeted interventions may shift patterns of behavior, structures, or relationships toward sustainability (Abson et al., 2016; Fischer & Riechers, 2019). In this paper, they specifically act on misalignments in actors' logics and relational dynamics, the mechanisms that underpin stagnation in neighborhood heat transitions, thereby creating openings for more constructive collective action facilitating progress in heat transitions.

Our relational lens aimed to explore how actors and their meaning structures contribute to deadlocks. We found that while actors and their logics are deeply intertwined, embedded in institutional contexts and entangled in daily interactions, they often fail to connect meaningfully in practice. Misalignments occur at two levels. First, a misalignment of meaning structures: actors operate from different logics that shape how they define problems and envision solutions. These logics are often incompatible, making content alignment difficult and leading to divergent problem definitions and conflicting solution pathways. Second, a neglect of the inter-relational dimension: collaboration falters not only due to content misalignment, but also because interpersonal dynamics (e.g., trust, emotions, conflict and relational quality) are insufficiently considered. While full alignment of logics may be unrealistic, indeed, an utopia, the challenge lies in navigating these differences. Even when actors recognize their divergent logics, stagnation is often amplified by the absence of relational tools or spaces to work through them constructively. This highlights a critical gap: the interpersonal dimension is underdeveloped in current neighborhood heat transitions.

Importantly, these two sources of misalignment reinforce one another. While interpersonal friction rarely arises in complete isolation from content misalignment, it can amplify or solidify existing substantive disagreements, turning manageable differences into enduring deadlocks. In the sections that follow, we unpack the nature of these misalignments and how they were identified. This lays the groundwork for presenting the leverage points, illustrating how they can be employed to navigate tensions and foster alignment in collective heat transition processes. Table 4.8 provides an overview of the identified misalignments, how they became

apparent, and the associated leverage points which are elaborated upon in the upcoming section.

Table 4.8. Key misalignments and leverage points in neighborhood-heat transitions

Key misalignments	Apparent from	Leverage points
Substantive: Rooted in conflicting meaning structures.	Multiplicity, incompatibility, fluidity of logics within and among actors groups.	Transparency as substantive practice
Interpersonal: rooted in neglect of the interpersonal dimension	Interrelationality of logics	Investing in quality of relations Using time as a resource

4.5.1 Misalignment of meaning structures

Our analysis reveals that a key source of stagnation in neighborhood heat transitions lies in the misalignment of meaning structures, the underlying logics through which actors interpret problems, define priorities and envision solutions. The result is a fragmented transition landscape where alignment is difficult, not due to lack of willingness, but due to lack of shared meaning.

A first challenge of shared meaning stemmed from the *multiplicity* of (coexistence of multiple and sometimes competing) logics among actors. This became apparent from the neighborhood approach theme, where political ideologies and institutional capacities shaped divergent perspectives: some local authorities emphasized social responsibility, others prioritized individual autonomy. These institutional logics frequently misaligned with residents' logics, rooted in diverse housing situations and concerns about consumer control, anti-monopoly positions, and affordability. Misalignment thus arose from the simultaneous presence of diverging logics within and across actor groups, illustrating institutional pluralism (Fuenfschilling & Truffer, 2016; Greenwood et al., 2011). As a result, neighborhood approaches often functioned less as coherent policy frameworks and more as contested arenas where interpretations and priorities collided.

Secondly, challenges of shared meaning became apparent from the observation that logics are not just divergent but at times structurally *incompatible*. Under the funding theme, for example, a capacity-building logic centered on institutional process-setup clashed with a redistribution logic focused on equitable resource allocation. In the absence of additional funding, these logics remain fundamentally at odds, exposing a deeper mismatch between the financial structures of heat transitions and the lived realities of marginalized communities.

So, we see that actors often fail to connect at the level of underlying reasoning. Misalignments of meaning structures therefore not only stem from the multiplicity of logics but at times also from their inherent incompatibility. These logics rarely shift easily, leading to enduring tensions and possible deadlocks. Tensions

emerged where conflicting logics collided, highlighting the relational nature of meaning-making in neighborhood heat transitions.

Importantly, misalignments are not confined to the binary of residents versus institutions. We observed they occurred between housing corporations, heat providers, and local authorities as well. While the presence of more actors unsurprisingly increases the number of meaning structures, progress is not hindered by diversity perse, but by the lack of open engagement with and awareness of these differences and the assumptions that underpin them. For example, articulating and comparing different interpretations of affordability could help authorities better understand what financial structures would facilitate progress in vulnerable neighborhoods, such as addressing upfront costs. The absence of such mapping represents a missed opportunity for mutual understanding and progress.

Moreover, misalignment is further complicated by the context-specific and relational ways in which these logics are mobilized. By examining logics across themes, we found that actors do not operate from a single, fixed logic. Instead, they draw on different logics depending on the issue, context, and interaction. Neighborhood-level heat transitions are thus shaped by a fluid interplay of reasoning patterns, challenging assumptions of uniformity in socio-technical transitions (Otchere-Darko et al., 2025). While this fluidity increases complexity, it also provides opportunities to disrupt the path-dependent character of institutional logics. Logics itself may not shift easily at the structural level (Fuenfschilling & Truffer, 2014), yet, their *use* does seem to change more easily. This *fluidity*, thereby, also offers strategic leverage. If logics are not fixed, there is room to reframe issues and open new spaces for connection, and potentially, over time, subtly challenge and reshape logics. We observed moments where actors appealed to similar logics within and across themes. For example, in the theme of privatization, both residents and market actors occasionally invoked fairness logics, indicating potential for mutual understanding. Yet, this potential often remains untapped due to a lack of explicitness: actors' underlying logics often remain implicit, which allows for assumptions being left unspoken, distrust to accumulate and ultimately misalignments to remain unresolved.

This leads us to the first potential leverage point: treating transparency as a substantive practice, not merely a procedural requirement. Substantive transparency offers a point of intervention by making explicit the logics behind decisions, including the dilemmas and value-laden tradeoffs that shape them. Where Bush et al. (2016) call for vision alignment, we propose that a necessary first step in enacting such transparency in practice is making the reasoning behind decisions visible, through mapping and articulating different logics at key decision moments within the process. Research on acceptance shows that people are capable of understand-

ing and accepting trade-offs, especially when communicated honestly and clearly (Kluskens et al., 2024). Such transparency can foster trust, reveal hidden power dynamics, and enhance mutual understanding. It also opens space to engage with and potentially shift assumptions embedded in actors' own logics. In this way, transparency becomes a mechanism for navigating complexity. It is precisely here that the mapping of a wide range of logics proves valuable, as it helps pinpoint exactly where misalignments occur and where alignment may be possible by identifying overlapping concerns (such as affordability or fairness logics) and reframing them as collective goals, thereby creating an opening for more constructive collaboration across multiple actor groups.

4.5.2 Neglect of interrelational dynamics

A second key source of tensions in current heat transition approaches is the misalignment in interpersonal dynamics, stemming from a neglect in quality interpersonal interaction. While interpersonal tensions rarely occur independently from content misalignments, they frequently act as amplifiers or solidifiers of content disagreement, turning minor disagreements into persistent stagnation.

Challenges of interpersonal interaction became evident by demonstrating the relational nature of logics: they evolve through interaction, not in isolation, and interpersonal dynamics play a critical role in shaping meaning structures. For example, the privatization theme revealed how a heat provider's economic viability logic, triggered a burden-shifting logic among housing corporations. Similarly, in the participation theme, authority's enactment of a transparency logic heightened residents' sense of agency. This led to epistemological conflicts and prompted a strategic mobilization logic among residents, ultimately complicating collective progress. These shifts highlight that actor's logics can influence and provoke reactive, adapted, or oppositional logics in others, indicating that these logic shifts are not merely cognitive but relational enacted patterns, driven by social dynamics and interpersonal conflict.

Research supports this view, showing that relationships have significantly shaped how actors perceive transitions and adopt logics (Bögel, 2024; Shirani et al., 2024). Our findings extend this by showing that these relationships span both inter-group and intra-group dynamics. This underscores the social embeddedness of logics and the need to focus on actors' interpersonal interactions. Therefore, we argue that progress in heat transitions depends not only on alignment in content or structure, but also on the interpersonal realm. When actors struggle to align on meaning structures, investing in the design and quality of interactions and relationships becomes essential. Put differently: when logics cannot meet on substance, strong interpersonal relationships can create space for constructive engagement.

In this regard, transparency alone is insufficient to shift positions; how interactions are structured, facilitated, and nurtured is equally critical. While previous research highlights the importance of carefully designing interactions to foster relationships and acceptance in transition processes (Bronsvoort et al., 2023) our findings show that especially the relational quality of these interactions remain undeveloped in the design of studied neighborhood heat transitions. Below we elaborate on what is concretely missing and what should be improved in practice.

Our findings confirm that although interaction design is actively considered, particularly in vulnerable neighborhoods, it often remains confined to formal public engagement or practices of "unburdening", typically narrowly framed around the goal of "making neighborhoods gas-free". This framing shapes assumptions about who should participate and which issues matter, often excluding residents based on presumed vulnerability. This was especially evident in the themes of urgency and participation, where residents were frequently sidelined despite having relevant concerns or priorities beyond the dominant gas-free narrative. In the urgency theme, for instance, local authorities' priorities often failed to align with residents' lived realities, limiting meaningful engagement and thus missing opportunities for relationship-building. In other cases, participation often followed conventional public participation formats, involving small, self-selecting groups, raising concerns about representativeness. This reflects the participation paradox (Van der Meer, 2018): efforts to broaden participation can unintentionally make it more exclusive. As Bronsvoort, Hoffman, and Hajer (2023) argue, conventional formats like argument-based discussions are inaccessible to many, while alternative modes, such as storytelling or experiential sharing, remain underused.

Beyond improving the structural design of participatory processes, our findings also show a deeper issue: the quality of relationships within these processes is rarely foregrounded. Interaction design typically emphasizes structure, format, and procedural clarity, but tends to neglect the relational dimension, how trust is cultivated, emotions are acknowledged, and assumptions are surfaced. We argue that this relational layer is not a soft add-on, but critical for navigating the interpersonal tensions that arise in neighborhood heat transitions. Without deliberate attention to the interpersonal quality of engagement, even the most thoughtfully designed participatory spaces risk perpetuating exclusion, misunderstanding, and disengagement.

This leads to the second leverage point: investing in the quality of relationships, shifting the focus from merely designing participatory spaces to actively nurturing the quality of interactions within them. Carefully staging encounters for collaboration 'naturally' to emerge is not sufficient, as it often leaves interpersonal tensions, mistrust, and unacknowledged emotions unaddressed. The potential

leverage point of relational quality intervenes by placing facilitation and relationship building at the center of participation processes, structuring encounters to build trust, acknowledging emotions, and navigating tensions. Skilled facilitation thereby can deliberately create space for emotional expression, recognize power dynamics, and ensure that engagement goes beyond rational debate, aligning with calls to design for diverse forms of expression (Bronsvoort et al., 2023), emotion in sustainability transitions (Coops et al., 2024; Lindström et al., 2024, 2025), and research showing that actors are often emotionally charged in change processes navigating tension, loss, and impasse (Lowes & Woodman, 2020). By focusing on the quality of interactions, rather than simply the presence of participation or transparency around logics and assumptions, this approach adds a crucial layer of relational depth, and can make the interpersonal realm a meaningful site for progress in heat transitions. Ultimately, by investing in the quality of interactions, actors can cultivate the relational ground for working productively across differences, instead of pursuing consensus. This reframes participation not as a procedural checkbox or mere channel for influence, but as an active practice of relating.

Nurturing relational quality requires time. At the same time, logics emerge and evolve through contestation, negotiation, and trade-offs, with actors moving between them over time. Heat transitions should therefore not be understood as fixed trajectories, but as dynamic arenas where logics evolve and are continuously re-evaluated. Yet, time is often underutilized in current NPLW pilot projects, under which studied neighborhoods fall. Although formally framed as *proeftuinen*, intended as spaces for learning and experimentation[14], these pilots are frequently approached as goal-oriented instruments focused on delivering tangible outcomes. This neglect of temporal space can significantly constrain the transformative potential of such initiatives, as time enables actors to engage in incremental experimentation, reflection, and mutual adaptation. This brings us to our final potential leverage point: using time as a resource. Treating time as a resource means recognizing that alignment processes, whether on content or relational dimensions, unfold gradually. Rebuilding trust, working through loss, accommodating uncertainty, and iteratively reframing problems all require temporal space. Operationalizing this leverage point can involve deliberately structuring projects to unfold gradually by building deliberate pauses for reflection, iteration, and sense-making into project timelines, allowing actors to gradually adjust their assumptions, rebuild trust, and realign logics as the process unfolds. Doing so requires a cognitive shift among local authorities and other actors to recognize pilot projects not just as sites for innovation, but also as safe spaces for doubt, failure, and learning. When time is treated as a resource in this way, neighborhood arenas can function as genuine experimental spaces, exactly what collective heat transitions so fundamentally need, and can ultimately cultivate more sustainable forms of collaboration in collective heat transitions.

4.6 Conclusion

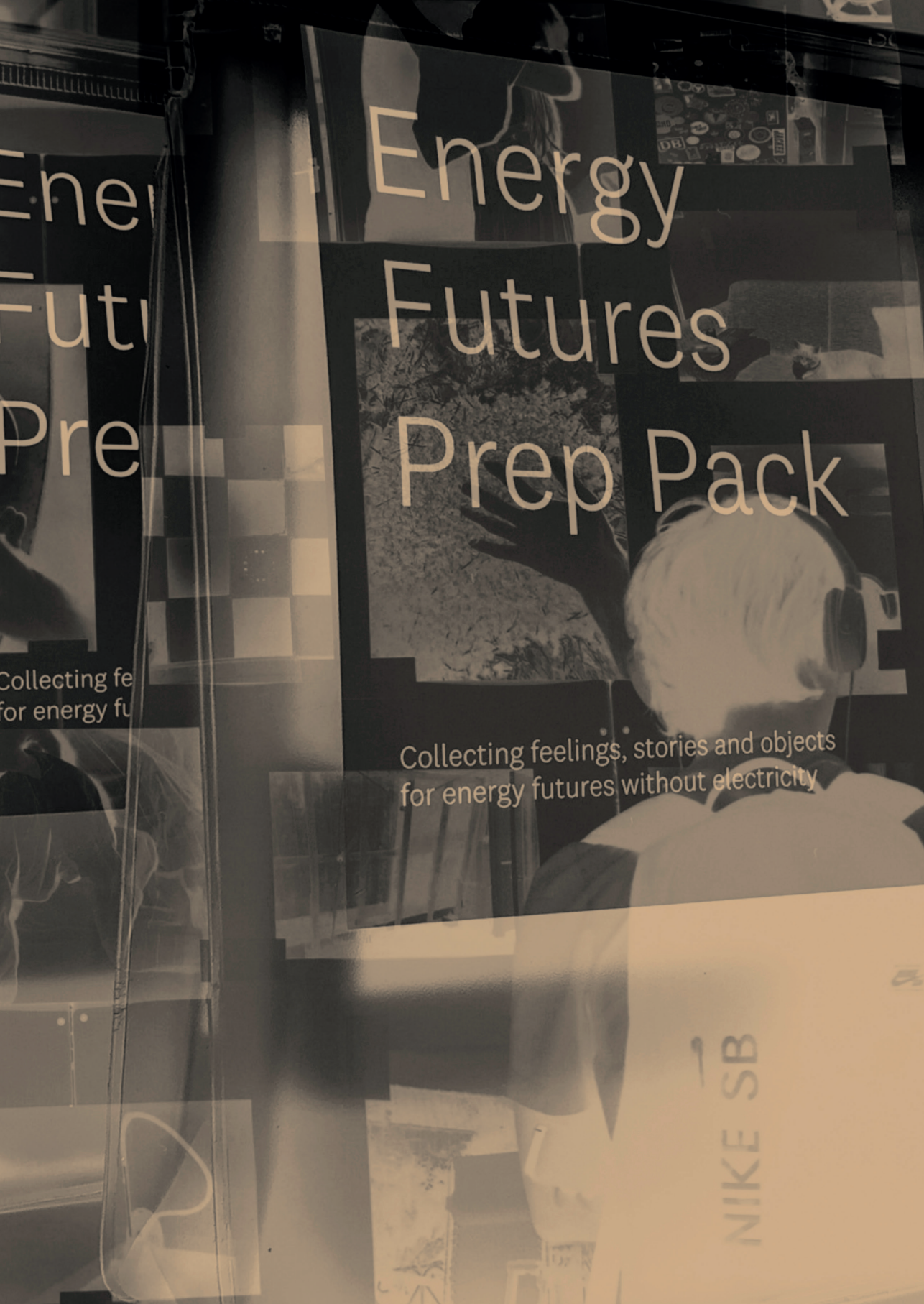
This paper has explored the tensions shaping neighborhood-level heat transitions, arguing that these are dynamic and contested processes driven by evolving multi-actor relationships and interactive logics. While technical, economical, and behavioral dimensions are well studied, the relational dimension (how actors interact, interpret and (dis)align over time) remains underexplored. Yet, it is precisely within these relational dynamics where tensions emerge around the key themes of participation, privatization, urgency, funding and the neighborhood approach itself.

Our relational approach revealed two core misalignments, one rooted in misaligned meaning- structures, and one in the neglect of relational dynamics. To overcome these misalignments, we uncovered potential leverage points grounded in transparent, temporal, and relational practices to address context specific challenges and foster acceptance and collaboration in neighborhood heat transitions. While the underlying tensions of misaligned logics and relational frictions are likely to appear beyond marginalized neighborhoods, their manifestation may differ in more affluent areas or in governance scales beyond the local level. Accordingly, the leverage points we identify function as transferable heuristic rather than a universal solution. Future research could examine how these dynamics play out across diverse socio-economic contexts and system levels, testing and refining the leverage points in different settings. This could also provide insights into how these micro-level interventions may work through meso- or macro-level dynamics and propagate broader system change. Such work could help to clarify the broader applicability and limits of the relational, institutional mechanisms proposed here.

By situating acceptance and institutional logics within the concrete context of heat transitions, and framing these transitions as relational processes, we advance a more integrated understanding of why collective efforts often stall. This perspective goes beyond acknowledging complexity; it offers a grounded and workable approach to local heat transitions. Identifying multiple, divergent logics, reveals not only analytical patterns but also where misalignments in content and relational dynamics occur, and how investing in the relational realm can mitigate these tensions. Especially the focus on relationship quality serves as a productive heuristic, reimagining interaction and participation not as consensus-building, but as a practice of relating. Relational depth thus becomes a practical tool for navigating complexity and unlocking progress in local heat transitions. This calls for spaces where actors can express positions, emotions, and engage in mutual reflection, and where they see themselves not as external overseers of the process, but as embedded participants in the relational dynamics they seek to shape. In essence, we argue that embracing relationality is not optional, it is necessary for overcoming stagnation and enabling collective progress in neighborhood heat transitions.

Eindnoten

11. Data from Statistics Netherlands (CBS). Statistics from 2021 (no later data available). Statistics have been cross-checked and compared with years 2020, 2019, 2018, 2017 and 2016 to draw reliable conclusions on stability of income level over years.
12. Ethical approval: the study received approval from the Ethical review board. All participants provided informed consent, and all data were anonymized to ensure confidentiality.
13. Predefined criteria: being influenced or influencing the local heat transition on neighborhood level.
14. Voortgang proeftuinen aardgasvrije wijken in cijfers | www.nplw.nl/data-en-monitoring


Energy
Futures
Prep Pack
Collecting feelings, stories and objects
for energy futures without electricity
NIKE SB

Chapter 5

Energy Futures

A pause in the Thesis' Script

This chapter marks a deliberate break from Chapters 2-4. Instead of following the conventions of academic writing (in the format of articles, using frameworks, and doing analysis), this chapter takes the form of a reflective essay. It is grounded in my PhD journey and its unfolding impact in practice.

This essay is deliberately the last chapter. While the earlier chapters examined how engagement is organized and constrained in practice, this chapter turns that critique inward. It pauses and zooms out to reflect on how engagement is done in academia itself.

Throughout this thesis, I have shown that engagement in energy transitions is structured by recurring patterns: actors' roles, assumptions about participation, and habitual ways of designing and stimulating engagement. These patterns of how engagement is done shapes what it can achieve. My argument here is that similar patterns operate within research. When we *do* engagement in academia, we too tend to enact familiar conventions, roles, and habitual ways of working. In that sense, in academia too, we follow what I refer to as familiar "scripts" that shape how engagement plays out.

In this essay I reflect on what I find limiting about reoccurring scripts, why they deserve scrutiny, and why changing them matters. I do so by reflecting on my attempt to intervene in them through the Energy Futures Prep Pack. Rather than presenting empirical results in the conventional sense, in this chapter I reflect on the effects of that intervention: on public discourse, on research practice, and on my own role as a scholar. This chapter is therefore less a conclusion than a pause, an invitation to reflect on how the scripts we perform in research shape the futures we help bring into being.

5.1 Reoccurring scripts of engagement in energy transitions

Citizen engagement is widely celebrated as essential to energy transitions. Yet, in practice, meaningful engagement often remains elusive. Citizens are still cast as "hard to reach," "unwilling," or "difficult to engage". What I repeatedly encountered in my research, is that ambitions of participation are high, but the spaces where people can meaningfully contribute remain surprisingly narrow. Engagement is often organized around predefined policy goals or future scenario's, frames that many do not relate to or feel equipped to respond to. Meanwhile, the domains in which people hold deep expertise, their own lives, lived experiences and everyday contexts, are often left out. Even when people participate, their ways of engaging frequently do not 'fit' the habitual patterns of how engagement is envisioned to be done toward these predefined issues. Over time, and inspired by Maarten Hajer and Jeroen Oomen[15], I began to see these patterns as scripts, familiar ways of stag-

ing ('doing') engagement, often confined by narrow frames, that reproduce linear, often techno-optimistic, extensions of the present, limiting what futures can be imagined or transformed.

What became increasingly uncomfortable during my PhD was realizing that academia is not exempt from this critique. The way we study engagement often mirrors the same scripts we criticize in practice. Even research designed to be inclusive or participatory, frequently operates within surprisingly narrow frames. Engagement is typically studied *within* predefined domains such as "energy transitions" or "energy systems", as if these are self-evident arenas or issues. From within these frames, energy systems are typically understood as sociotechnical challenges involving the interplay of infrastructures, technologies, and human behavior, with energy largely reduced to electricity and heat. These frames are far from neutral. They implicitly position energy as a commodity, citizens as external to the system, and climate imperatives as the primary justification for change.

From the perspective of everyday life, however, "energy" is not only a matter of kilowatthours or thermal efficiency; it is felt in bodies, relationships, moods, and spaces. It is fundamentally something that sets things in motion in far broader ways than our research often allows. In research we often confine "what sets things in motion" to powering devices, enabling mobility, and providing heat. Once I started paying attention to this gap, it became harder to ignore. I began to see that by approaching engagement through narrow frames such as "energy systems" or "energy transitions", and thus prescribing the issues, concepts and methods through which we study engagement, research itself reproduces the same scripts it seeks to analyze. When engagement is studied through narrow frames, it is hardly surprising that it is often perceived as difficult or disappointing in its transformative potential.

The problem, then, is not only how engagement is practiced in reality, but also how it is researched in academia. The issues and frames around which engagement is studied are often predefined, leaving little room for alternative perspectives or more imaginative pathways. This not only restricts political and social imagination, making radical alternatives harder to envision and pursue, but also limits the possibility of meaningful engagement itself. When the frame is narrow, it constrains who can participate and what kinds of change engagement can enable. Incrementalism becomes the default, and opportunities for more radical or transformative change diminish. Engagement risks becoming a managed performance, a play in which the script is already written, and where its outcomes often fall short of their promises.

5.2 The need for changing the script

These observations gave rise to a desire to at least challenge this prevailing script. Rather than intervening through critique alone, I wanted to experiment with doing engagement differently. It is from this desire that the *Energy Futures Prep Pack* was developed: a method designed to disrupt dominant ways of thinking about energy and to open new spaces for imagination and participation. Participants completed the Prep Packs, which were then exhibited as they were during Dutch Design Week 2024, without prior analysis in the conventional scientific sense. Instead of presenting traditional empirical results, in this essay I reflect on its effects on public discourse, its implications for research practice, and its significance for my own role as a scholar.

This essay therefore presents an attempt to change the script of citizen engagement in energy transitions through a creative approach that operates at two levels: First, it challenges the dominant frames from within scholars are typically working, prompting reflection on the very epistemological assumptions that shape research, the frames and issues through which we approach and study citizen engagement. Second, it departs from conventional academic practice. Instead of remaining in the familiar role of analytical observer, studying engagement, producing knowledge, and writing publications, this approach invites participants to define the issue or story, and visitors to do the interpretation and analyses. In collaboration with a designer, I stepped outside the academic context to facilitate spaces for dialogue and debate beyond academia. In doing so, this essay also reflects on the evolving script of the researcher's role and our methodological approaches to engagement itself.

5.3 The intervention: the Energy Futures Prep Pack

The Energy Futures Prep Pack was developed in collaboration with speculative designer Lisa Mandermaker, as part of Collaborations for Future[16], a project by Foundation We Are. Ten (climate) scientists and ten designers were paired without a predefined brief, allowing experimentation rather than predefined outcomes. Our shared interest in participation, futures and debate, led to the development of the Energy Futures Prep Pack.

The Energy Futures Prep Pack (Picture by Nikki Kluskens)

The set up of the Energy Futures Prep Pack

From the start Lisa and I wanted to challenge dominant frames around energy by working in a more contextualized and embodied way. Rather than beginning with "the system" we asked a more fundamental question: *What does energy mean to people?* By doing so, we opened space for multiple associations or issues that go beyond policy- or technology-driven ones, allowing participants to co-create future frames they could recognize and relate to. Drawing from design research we developed the Energy Futures Prep Pack as a cultural probe, that invited participants to creatively explore and reflect on energy, based on their own lives and contexts. Cultural Probes do no aim to define, measure, predict, or generalize, but elicit personal insights, meanings and open imaginative space. In that regard, the Prep Pack was designed to help participants engage with energy in new and embodied ways, using it as a prop to explore alternative frames and imagine possible futures.

Participants received the Energy Futures Prep Pack at home and engaged with it independently over the course of a week. We as developers remained deliberately

absent in this imaginative process. This independence allowed for participants' own interpretations, associations, and desires to guide the exploration, and meanings and futures to emerge from lived experience, rather than system logic or institutional expectations. To broaden the frame and possible futures, participants engaged with the pack through two sequential phases:

Phase one: exploring the meanings of energy

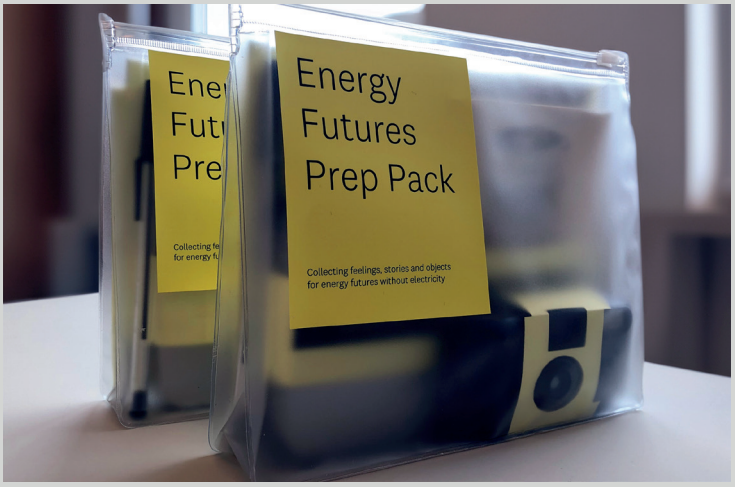
Participants first explored energy in the broadest possible sense: material, bodily, social, and emotional. Instead of starting with electricity or heating systems, prompts focused on sensory and personal experiences: how energy feels, tastes, smells, or sounds; what gives or drains energy; where is it felt in the body. Responses were explored and captured not only through writing, but other non-verbal forms, like photography and drawing, recognizing that sensory and contextual meanings exceed what language can fully capture.

This phase served two aims. To reveal and discuss the broad range of associations and dimensions that people connect to "energy", in the body, in social life, in material infrastructures, and in mental or emotional states, inviting sensory and contextual meanings that often fall outside the scope of conventional energy discussions. Second, it acted as a cognitive and affective loosening as preparation for phase two, reducing the likelihood that participants' imagined energy futures would only be an extension of the present and only related to electricity and heat. While previous research has explored the meaning-making around specific energy carriers (e.g., electricity or heat) this approach extended the inquiry to energy in its broadest conceptual sense: anything that can set something in motion.

Phase two: speculative scenario and futuring

Participants then entered a speculative scenario: imagining life without electricity. Removing the most recognizable and institutionalized form of energy served as a rupture that disrupted habitual assumptions and opened space to radical reframe futures beyond linear extensions of the present. From this blank slate, they imagined how they would live, what they would prioritize, and which forms of energy they would revive, invent, or abandon. The goal was not to simulate crisis or promote resilience planning, but expand the horizon of possibility, of creating future frames they could relate to. Through drawing, writing, and storytelling, participants articulated futures ranging from precarious and dystopian to communal, playful, and deeply hopeful. These visions revealed not only alternative infrastructures but alternative energy carriers, with care, connection, autonomy, nature, and the body emerging as central organizing concepts.

Throughout, citizens were not positioned within predefined scholarly frames, nor were they asked to respond to evaluate existing transition pathways. Instead, they



The content of the Energy Futures Prep Pack (Pictures by Lisa Mandemaker)[17]

engaged on their own terms, treated as sense-makers and co-authors of possible futures, developing and inhabiting frames of meaning that resonated with futures they can relate to. Our role was not to conduct the analysis, but to provide preparatory materials that enabled participants to generate their own meanings. The Prep Pack thus became more than a research tool; it functioned as a method for unsettling dominant framings and expanding the imaginative bandwidth of energy futures.

For many participants, the experience was intimate and disarming. They described the process as existential, touching on fundamental questions on what gives them energy, and what they wish to let go off in their imagined futures. Some experienced it as a pause in everyday life, a moment of reflection to tune in with their "own" energy, ultimately surfacing hidden priorities and forgotten desires. The Prep Pack became not only a tool for meanings making, but also for self-inquiry, a way to reflect on what they wished to keep, and to let go off.

5.4 The exhibition

The completed Prep Packs were publicly displayed in the Collaboration for Future exhibition by Foundation We Are[18]. The presentation itself was a deliberate intervention in how engagement is typically done in energy research. Rather than analyzing or categorizing participants' contributions, we displayed the materials *as they were*: personal, sometimes open-ended and interpretative. Visitors encountered participants' meanings of energy and speculative futures, supported by audio narrations explaining the process behind the returned packs, but without prescribing interpretation. Audiences were invited to sit with the material and make sense of it on their own terms, redistributing interpretive authority in a way uncommon in engagement work.

The exhibition showcased photographs, drawings, and written reflections from the first phase, centered on the question: What does energy mean to you? These revealed a wide range of associations, including sexuality, intimacy, outdoor life, food, and play. Visitors also engaged with the imagined futures from the second phase through small metal cans containing participants' symbolic *energy carriers* that they wished to take into their envisioned future. Some held objects, such as a deck of cards symbolizing play, while others held intangible ideas. One participant, for example, screamed into the can, explaining that her voice would be a vital energy carrier she would take into the future. Not all symbolic energy carriers were explained by participants. Some cans remained intentionally opaque, inviting multiple interpretations. This ambiguity was not accidental but a methodological choice: the Prep Pack was designed as a prop for reflection and debate, not as an extractive research instrument.

Many visitors described being moved by the depth and honesty of the contributions, encountering energy not as an abstract system or resource, but as something lived, pulsing through sexuality, politics, relationships and everyday moments of care and pleasure. Several described the exhibition as intimate: a rare glimpse into the inner worlds of strangers, that both surprised and resonated with their own.

In this way, I as a researcher took on a role distinct from the traditional analyst. Rather than interpreting or categorizing outcomes, Lisa and I acted as facilitators of space, curating conditions for reflection, conversation, and meaning-making, while allowing interpretation to remain distributed and unfinished.

5.5 Impacts of the Energy Futures Prep Pack

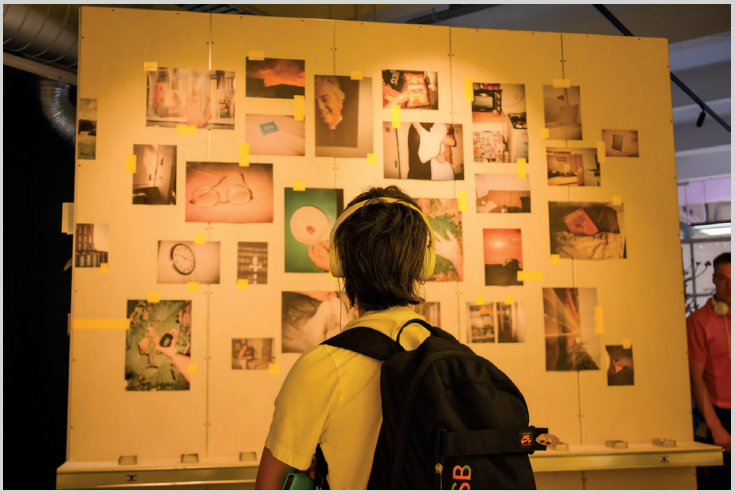
Our attempt to challenge the established script of engagement in energy-transition studies generated impact across personal, public and academic contexts. More importantly for me, it unsettled my own assumptions about what engagement can be, and what impact might look like beyond the conventional metrics of doctoral research.

For participants and visitors, the Prep Pack was often experienced as personal and emotionally impactful. Many described how it shifted their sense of their own energy. This affective response signaled a form of engagement rarely captured in traditional academic outputs, one that moves beyond intellectual participation toward experiential resonance.

Public reception amplified these effects. The exhibition featuring the Prep Pack, was selected as one of the Top 10 must-see shows of Dutch Design Week 2024[19], and the Prep Pack itself received national and regional media attention.[20, 21] Over the course of the event, roughly 9500 visitors encountered the work. The project's impact thus unfolded in a way that is atypical for a PhD trajectory, not primarily through publications, but through facilitated debate across a broad public.

These conversations extended into academic settings as well, including a session on creative methods for alternative energy futures at the Royal Geographical Society (RGS) conference in Birmingham in 2025. There, the work contributed to broader debates on speculative, affective, and participatory approaches to energy research. These discussions surfaced methodological and epistemological questions: how such an approach might be further developed into a scientific method, and whether the resulting materials could themselves become props for researchers, a means to reflect on, challenge, and rewrite the frames through which engagement in energy transitions is studied.

The full presentation of the exhibition at Dutch Design Week 2024 (Pictures by Hannah van Luttervelt, Foundation We Are)



The full presentation of the exhibition at Dutch Design Week 2024 (Pictures by Hannah van Luttervelt, Foundation We Are)

Beyond academia, the Prep Pack continues to travel. The project has been selected for the German touring exhibition *Power to Change*[22], where it will again operate as a conversational object, this time in neighborhood settings across multiple German cities. There, much like in the original installation, it will create a space not for answers, but for inquiry, friction, and collective reimagining.

5.6 Toward a different script for engagement in energy transitions

At the beginning of this essay I argued that changing the script of engagement in energy transitions requires changing how we approach engagement in research itself. Critiquing engagement in policy arenas is one thing; recognizing how our own research choices shape, and sometimes constrain, engagement is another. The frames, concepts, and methods we use influence what becomes visible, who feels able to participate, and which futures can be imagined. Changing the script of engagement in energy transitions therefore also means reflecting on, and sometimes rewriting, our own.

Through the Energy Futures Prep Pack, I experimented with doing just that, both epistemologically and methodologically. First, we set the stage for alternative and wider frames. Rather than centering on technical or policy-driven understandings related to energy, the Prep Pack opened space for people to think and speak about energy differently, expanding the "what" and thus frames we invite people to engage with in energy research.

Second, we resisted the urge to predefine those frames ourselves. Instead of imposing cognitively demanding or argumentative modes of participation, the Prep Pack allowed frames to emerge from participants' lived experiences. Meaning could be expressed not only through words and arguments, but through sensory, affective, and creative forms. This shift decentered certain forms of expertise, expanded who could meaningfully participate, and opened up imaginative space for alternative energy futures (allowing frames to become more relatable). It also pushed me to rethink how engagement research itself can become more engaging. We deliberately shifted interpretive authority as well. Rather than treating participants' framings as data to be analyzed, we invited participants to become framers and sense-makers, and visitors to take on the role of analysts. The Prep Pack therefore acted not as a tool for extracting data, but as a prop for reflection, dialogue, and imagination, a space intentionally designed for debate rather than answers.

In taking this approach I stepped away from the role of researcher-as-expert, and leaned into a role of researcher-as-facilitator. Taking on this role meant moving away from being a researcher who provides tangible results toward becoming someone who holds space for questioning, disagreement, and emergent possibilities. This shift challenged my assumptions about the meaning of impact in aca-

demia, not only in terms of policy influence or academic metrics, but also as the ability to create and hold spaces for creative debate. This shift can represent a different script regarding the role of research, and a more reflexive and broader understanding of impact in academia.

Ultimately, this experience has given me renewed energy to 'do' engagement differently as a researcher. Not only by widening frames and making research itself more engaging, for participants as well as for myself, but also by experimenting with more engaging ways of writing about it. I have come to see how the scripts we follow do not merely describe reality; they actively shape it. That is why changing the script matters. Rewriting it can change the play of engagement, from something that often feels boring, difficult or exclusionary, into something that has the potential to be genuinely transformative.

Eindnoten

15. Hajer, M. A., & Oomen, J. (2025). *Captured Futures: Rethinking the Drama of Environmental Politics*. Oxford University Press.
16. Collaborations for Future | www.collaborationsforfuture.com
17 For more detailed information about the content of the EFPP see https://www.youtube.com/watch?v=LfUviA0mfZs
18. The exhibition was designed by Sander Wassink, produced by Olga Flor, and curated by Kornelia Dimitrova.
19. 10 tips voor Dutch Design Week 2024 | www.vpro.nl/festivals/ddw
20. Coverage on BNN/VARA's *Vroege Vogels*. Met design de wereld verbeteren | www.bnnvara.nl/videos/614773
21. Coverage on *Cursor* Eindhoven University. Toekomstige energiescneario's verkennen tijdens DDW | www.cursor.tue.nl

Chapter 6

Conclusion

Citizen engagement is widely recognized as a cornerstone of successful energy transitions (Miller et al., 2013; Stirling et al., 2008). Citizens are no longer seen as passive recipients of change, but acknowledged as active stakeholders capable of shaping and transforming energy systems (Wahlund & Palm, 2022). This recognition of their importance is reflected in policies that actively promote citizen involvement (Directive 2018/2001, 2018; Rijksoverheid, 2019).

Beneath this recognition lie assumptions about what citizen engagement entails and what it is expected to achieve. Engagement is often framed as a means to secure support, empowerment, or legitimacy (Bidwell, 2016; Chilvers et al., 2021; Köhler et al., 2019). Yet, research shows that citizen involvement does not automatically lead to these outcomes (Jasanoff, 2018; Radtke, 2025). This thesis demonstrates that such promises of engagement are contingent upon how 'narrowly' it is conceptualized, institutionalized, and implemented.

Outcome-oriented framings and policy-practices typically do not reflect an active and deeply embedded view on citizens and their engagement. As a consequence, participation is often treated as something external, something to be designed and stimulated (Stirling et al., 2008), assuming that well-designed engagement will yield positive results. This instrumental logic applies a narrow understanding of engagement, reducing it to an abstract ideal or a tool to be optimized, and implicitly categorizing forms of engagement as 'good' or 'bad' depending on their alignment with predefined goals such as acceptance, empowerment, or democratic legitimacy (Dunphy et al., 2024; Langer et al., 2017).

This thesis has challenged dominant assumptions by adopting a combined embedded, relational and procedural lens to examine how engagement is constructed in practice, within specific contexts, in relation to others, and over time. By investigating how engagement is enacted and shaped in practice, it provides a more nuanced account of both the barriers and possibilities of engagement, and reveals how lived realities complicate the promises underlying mainstream framings.

By introducing this broader view, the study interrogates the assumptions and expectations underpinning mainstream outcome-oriented citizen engagement approaches in policy-practice and research. In doing so, it not only exposes the limitations of such framings but also suggest ways they can be theoretically enriched and better aligned with the complex realities of engagement, ultimately offering a more nuanced understanding of citizen engagement and its promises as well as its limitations.

This thesis explored this by addressing the following research question: *How can citizen engagement be understood comprehensively, and what implications does this have for citizen engagement in energy transitions?*

To answer this, the thesis examined three research gaps and problems in Chapters 2-4, followed by a reflection in Chapter 5 on our own role as researchers in debates concerning engagement in energy transitions.

Chapter 2 explored the first gap: the limited understanding of how engagement contributes to outcomes such as acceptance. Existing studies often conceptualize community acceptance as a static outcome rather than a dynamic process (Batel & Rudolph, 2021; Kluskens et al., 2024; Wolsink, 2018). This prevailing static view overlooks how acceptance emerges and thus how it is shaped through engagement.

Chapter 3 explored a second gap: the limited understanding of the promises of engagement in energy citizenship discourse. Such framings often assume that citizens both want and can take on more active roles in energy transitions, and that if they do not, they need to be empowered to do so. Such assumptions reduce engagement to an abstract ideal or status, something to be attained, while obscuring the structural inequalities and contextual barriers that shape people's ability to engage. Consequently, we lack nuanced insights into what constitutes energy citizenship, how it is formed in practice, and how this relates to outcomes such as empowerment.

Chapter 4 explored a third gap concerning coordination in collective heat transitions, particularly in marginalized settings. Dominant perspectives often portray these contexts as inherently difficult to coordinate, attributing challenges to citizens themselves. Such framing not only oversimplifies the role of citizens, but also neglects the relational dynamics that actually shape actors' engagement. This limits our understanding of the complexity of coordination, and where conflict, and ultimately stagnation, emerge.

Chapter 5 offered a reflection on an attempt to reshape the script of 'doing' engagement by experimenting with a creative approach to engagement, beyond the academic sphere. In doing so, it reflected on how predefined (thematic) domains or frames shape how we 'do' engagement both within academia and ultimately in practice. This chapter will not be part of the final conclusion, but will come back in the discussion in Chapter 7.

Before answering the main research question in section 6.4, the following sections will synthesize the findings from these chapters to show how they collectively

contribute to a deeper understanding of citizen engagement in energy transitions and the implications for theory and practice.

6.1 Community Acceptance

To unravel assumptions about engagement in relation to outcomes such as acceptance, Chapter 2 asked: *How does community acceptance come about in RET projects?*

This question was explored by analyzing community acceptance as a process across eight administratively successful, uncontested wind and solar energy projects in the Netherlands.

Findings show that community acceptance is not simply a matter of citizen attitudes or behaviors, but a multi-actor process, involving residents, municipalities and developers, and thus that community acceptance cannot be secured by targeting citizen alone.

Moreover, actors responded differently to various objects of acceptance, such as location or distribution of financial benefits. These responses were not isolated but carefully weighed in relation to one another. For example, dissatisfaction with one aspect could be offset by satisfaction with another. This goes beyond the idea that acceptance is determined by a fixed set of universal factors, and that it implies unanimous support for all aspects of a project. Even in uncontested cases, acceptance remained ambiguous and partial, with some elements accepted and others not.

Within this process the role of engagement proved nuanced and conditional, challenging the assumption that "more participation" equals "more support". First, actors who could engage meaningfully with a particular object of acceptance were more likely to accept that element. Yet, this did not necessarily translate into overall project acceptance. Support for one aspect did not guarantee support for others, as actors weighed different aspects against each other. Engagement therefore contributes to acceptance only in relation to specific objects of acceptance, and even when actors were involved in certain elements, non-acceptance of others remained. Depending on how actors weighed the importance of that object against others, overall acceptance could increase. Second, the study revealed that engagement preferences and desires vary widely. Not everyone wanted involvement in the same way or on the same issues. Offering participation opportunities across all objects therefore does not ensure broader support, as engagement desires are object-and actor specific. This diversity of engagement preferences nuances the idea that higher engagement automatically leads to broader support. What matters is not the quantity of engagement, but how well opportunities align with actors-specific engagement wishes towards objects of their choice.

Taken together, these insights show that acceptance is not a straightforward outcome of participation, but a weighing process shaped by the interplay of actors, their roles, and their relationship to different objects of acceptance. By tracing the process of community acceptance, this chapter offered a more nuanced understanding of how engagement relates to acceptance thereby unpacking assumptions and promises of outcome-oriented participation approaches.

6.2 Energy Citizenship

To unravel normative assumptions about engagement shaping the energy citizenship debate, Chapter 3 asked: *How and why do citizens assume particular roles in energy transitions and how do these enactments inform a more comprehensive understanding of energy citizenship?*

This research question was explored through three case studies of neighborhood heat transitions in marginalized Dutch settings, contexts rarely examined in energy citizenship literature. These cases broadened the empirical focus to publicly-led collective transitions where entrepreneurial engagement seemed scarce.

The findings show that role formation is multifaceted: roles emerge over time and are shaped by temporal considerations, institutional rules (such as mandates), and individual capabilities. Role enactment also proved to be relational, developing through interactions and influenced by the design of participatory approaches. Moreover, roles are negotiated and shaped by how individuals relate to the (energy) issue at hand.

This exploration of role formation informed a more comprehensive understanding of energy citizenship, suggesting that energy citizenship should be understood as a dynamic, embedded, cross- actor and fluid endeavor, rather than a fixed ideal to be achieved. This chapter thereby shifts attention from idealized models of engagement (*what ought to be*) to realities of participation (*what is*). It highlights two key assumptions, "ability" and "wanting", and offers important nuances to both.

On the assumption of "ability" the research reveals that citizens' capacity to engage is shaped by lived realities and structural conditions. Engagement is not a matter of individual willingness alone; it is deeply structured by social and institutional contexts. Focusing on citizens as a target group to be empowered through activation proves thereby to be limiting, as it ignores that meaningful engagement requires attention to broader conditions that enable or constrain participation.

On the assumption "wanting" results reveal that not everyone wants to be engaged in the same way or even towards the same issues of energy transitions. In fact, participation takes many forms, from passive to active, and extends beyond the

energy domain. Importantly, wanting to be engaged (and thus empowered) is not only reflected through taking on bigger or more visible roles. This shows that not all expressions of agency fit the dominant narrative that equates more active roles with greater empowerment. For instance, refusing to sign a heat contract can be a deliberate and meaningful act of agency. These findings challenge the assumption that active participation, often associated with added responsibilities, is the only or ideal form of empowerment, or the hallmark of 'empowered' citizens.

6.3 Local coordination in marginalized settings

To critically examine the assumption that coordination in local energy transitions is particularly difficult in marginalized contexts, an assumption simplifying the role of marginalized actors in obscuring local neighborhood heat transitions, Chapter 4 explored barriers to coordination through the question: W*hat tensions characterize neighborhood heat transitions, and where lie leverage points for advancing collective heat transitions?*

This question was addressed through three in-depth case studies of collective heat transitions in marginalized Dutch neighborhoods. Adopting a relational approach, the chapter examined tensions and misalignment in local heat transition coordination.

Findings revealed that tensions in neighborhood heat transitions arise around five key themes: participation, privatization, urgency, funding, and the neighborhood approach itself. Specifically, barriers to alignment stemmed from two core issues: misalignment of meaning structures and neglect of inter-relational dynamics.

Regarding the misalignment of meaning structures, results show that logics were diverse both between and within actor groups, multiple, and at times incompatible. Alignment is further complicated by their fluid nature, challenging the notion that actors operate from single, fixed perspectives. While multiplicity and incompatibility of logics pose coordination challenges, fluidity also opens up possibilities for navigating complexity. The results point to a key leverage point: treating transparency as a substantive practice, by making underlying logics explicit thereby creating possibilities to surface assumptions and address misalignments.

A second barrier is the neglect of inter-relational aspects. Findings showed the relational nature of logics, that they evolve through interaction, not in isolation, and that interpersonal dynamics play a critical role in logics formation. Misalignments stem not only from content disagreements but also from social tensions. While data showed interaction design is increasingly considered, e.g., through participatory processes, the quality of relationships is rarely foregrounded. This highlighted a second leverage point: investing in the quality of relationships, shifting from

merely creating spaces for participation to actively nurturing the quality of interactions within those spaces.

Finally, both logics and building relational quality evolve over time. Under pressure for rapid implementation, this dimension is often ignored. This highlights a third leverage point: treating time as a resource, acknowledging that meaningful coordination is a gradual process that cannot be rushed, and that time can be gained by investing in deliberate and purposeful time-use early on.

Together, these findings offer a more integrated understanding of why collective heat transitions often stall, particularly in marginalized settings. Attributing challenges solely to citizens proves reductive. Misalignments occur across and within multiple actor groups, both substantively and relationally. A key contribution is the importance of relational quality, which goes beyond designing participatory spaces and points to the need for stronger coordination of interpersonal dynamics.

6.4 A nuanced understanding of citizen engagement and its implications

This thesis examined what constitutes a more comprehensive understanding of citizen engagement and what this implies for citizen engagement in energy transitions. Using an actor-focused lens, one that accounts for the embeddedness, relationality and processual character of engagement, it analyzed community acceptance, energy citizenship and local heat transition coordination in marginalized settings, domains commonly approached with an outcome-oriented focus. The analysis revealed how engagement unfolds in practice and how this complicates the promises attached to it.

Across cases, three key ambiguities emerged in dominant framings: 1) in how engagement is conceptualized, 2) in how it is assumed to unfold, and therefore 3) in the promises attached to these outcomes of engagement.

First, a procedural view revealed that engagement in local energy transitions is multiple, dynamic, and often ambivalent. Chapters 2-4 showed diverse, and at times, contradictory forms, both within and beyond invited spaces, including acts of resistance as well as passivity. These enactments were fluid rather than uniform or 'stable'. Outcome-oriented framings, however, often reduce engagement to static categories (Chilvers & Longhurst, 2016; Pallett et al., 2019) or equate it with invited or idealized forms of participation within policy- or project-defined arenas (Leach et al., 2005; Pel et al., 2022). This tendency is particularly evident in community acceptance and energy citizenship literature, where engagement is often framed as invited participation (e.g., Langer et al., 2017; Suškevičs et al., 2019), or as idealized or promoted forms of involvement (Lennon et al., 2020). As results show, such framings capture only a fraction of what engagement entails, obscuring

the ongoing, multiple, and sometimes contrasting ways in which citizens relate to energy transitions. Taken together, these findings advance a view of engagement that is not a discrete act nor limited to participation in pre-defined projects, but a continuous, dynamic process in which actors negotiate, interpret, and enact their roles in situated ways over time.

Second, an embedded and relational perspective revealed that engagement is shaped by structural conditions and relations, not individual disposition alone. Chapters 2 and 3 showed how engagement is embedded in institutional rules and capacities, and relationally constituted through competing domains of everyday life and interactions with other actors. Outcome-oriented approaches often treat engagement as an external, individual attribute, confined to the energy domain. This positions citizens as a homogeneous, external 'public' to be informed, mobilized, or empowered, reducing them to passive, and sole, targets of governance (Chilvers & Longhurst, 2016; Frantzeskaki et al., 2016) and capturing only a partial view of how engagement unfolds. This thesis advances a view of engagement not being an external act, but deeply shaped by structural conditions and relations. Consequently, it advances a view of publics that is not singular or uniform, but multiple, differentiated, and continually constructed in response to specific contexts, actors, and engagement practices. For example, invited participation sometimes produced 'anti-publics', or framed citizens as 'unknowledgeable', or 'in need for unburdening', shaping how publics come into being and are positioned within transitions. Together, these findings underscore that publics and their engagement are not given or external, but continually constructed (Chilvers & Kearnes, 2020; Marres, 2008; Rodhouse et al., 2021) through structural conditions and relations.

Third, this broadened perspective reveals that expected outcomes of citizen engagement, such as acceptance and empowerment, are far more nuanced and conditional than static, unembedded framings imply. Chapter 2 showed that engagement cannot be reduced to a simple causal driver of acceptance. Its effect depends on object-and actor-specific wishes of engagement, and requires engagement across multiple actor groups, not only citizens or invited forms. How engagement is conceptualized, therefore, shapes whether correlations with outcomes like acceptance can be meaningfully established. Similarly, Chapter 3's processual approach to energy citizenship revealed different forms, barriers, and lived realities that challenge idealized notions of engagement and empowerment. An outcome-oriented view of empowerment, in particular, proved too narrow: correlations between "more engagement" and "more empowerment" could not be sustained once other forms than idealized engagement, and barriers to engagement, were taken into account. Finally, Chapter 4 showed that stalled heat transitions stemmed not from deficits in resident engagement, but from substantive and relational misalignments within

and across actor groups. These findings expose the limits of citizen-centered explanations and the ambiguity of outcome-oriented promises.

This thesis has demonstrated that the assumptions underlying outcome-oriented framings of citizen engagement, and the promises associated with them, are ambiguous. By offering deeper insights into the processes of community acceptance, energy citizenship and local heat transition coordination, it challenges the outcome-oriented approaches to engagement that often underpin these domains. Ultimately, a more nuanced understanding of citizen engagement, one that acknowledges its embedded, relational and processual nature, enables to rethink the conditions and assumptions underlying current outcome-oriented approaches to citizen engagement, and to identify where and why the promises attached to it may fail to materialize. By doing so, this thesis contributes to more reflexive, inclusive and realistic approaches to citizen engagement in sustainable energy transitions.

Chapter 7

Discussion

This discussion consolidates the findings from Chapters 2-6 and positions them within broader critical debates on public engagement. By connecting the empirical insights to conceptual and normative discussions in the field, this chapter clarifies how a relational, embedded and procedural perspective reconfigures key assumptions about engagement. The chapter proceeds through five interconnected themes, each illustrating how the insights refine or challenge existing discourse. Section 7.1 addresses ongoing debates on process-versus outcome conceptualizations of engagement; Section 7.2 reflects on debates around invited versus uninvited participation; Section 7.3-7.5 connect findings to broader normative questions and ideas of empowerment, responsibilization and democracy, respectively. Section 7.6 describes contributions to sustainability transitions scholarship, Section 7.7 outlines limitations and future research, and Section 7.8 outlines practical recommendations.

7.1 Process and outcome understandings of engagement

This thesis advances ongoing debates on outcome- versus process conceptualizations of engagement. Building on critiques of fixed and instrumental conceptualizations (Chilvers & Longhurst, 2016), this research demonstrated the value of adopting a relational, embedded and procedural lens. Conceptualizing engagement as an ongoing 'process' rather than a measurable 'endpoint', illuminates the *dynamics* through which engagement unfolds across settings, over time, in relation to other actors, and institutional environments. This shift fundamentally alters what becomes analytically visible and knowable about engagement. Rather than cataloguing diversity in actor roles or engagement types, this approach explains how forms of engagement emerge, relate to, and shape one another, reorienting the study from static typologies toward engagement dynamics, a theme still underrepresented in transition literature (Wittmayer et al., 2017). Tracing engagement dynamics exposed conditions under which engagement emerges, persists, clashes, or evolves, and helps unpack assumptions underpinning outcome-oriented framings, and why and how certain forms of participation relate to particular (desired) outcomes.

Applied to local contexts, this perspective reveals how every day and formal forms of participation, ranging from deliberative formats to practices beyond the energy domain, interrelate and co-evolve. It challenges compartmentalized understandings that treat deliberative participation and practice-based engagement as unrelated spheres (Chilvers & Longhurst, 2016), and bridges two strands of literature often studied in isolation (Pallett et al., 2019): deliberative approaches, concerned with participation design and democratic legitimacy, and practice-based approaches, concerned with mundane, embodied aspects of engagement. In revealing these dynamics, this study advances work that connects the governance of participation

with everyday practices through which transitions are enacted (Chilvers & Longhurst, 2016).

Ultimately, this dissertation not only extends calls for more integrated understandings of participation, it also challenges a persistent blind spot. While process-oriented approaches have advanced thinking by illuminating engagement dynamics, this study shows they remain limited if they focus on citizens alone. By foregrounding interactions among citizens, institutions, and other actors, this research demonstrates how engagement is co-constituted and why this matters for understanding engagement in transitions. It shows that the dynamics of citizen engagement cannot be meaningfully understood by examining citizens, of even multiple citizen groups, in isolation. A comprehensive understanding requires attention to the broader constellation of actors and institutional arrangements that shape, and are shaped by, citizen engagement. Understanding *citizen* engagement therefore demands moving beyond positioning citizens as the only relevant actors or units of analysis in citizen engagement research.

7.2 Invited and uninvited participation

This more comprehensive understanding of engagement advances broader debates around invited and uninvited participation, particularly concerning what counts as 'real' engagement. These invited participation debates often highlight the importance of more (meaningful) participation in policy and practice (Putters, 2014; Wittmayer et al., 2017) thereby approaching engagement as something to be designed, facilitated, and evaluated against envisioned transition goals such as acceptance or empowerment (Bidwell, 2016; Stirling et al., 2008). In doing so, they often channel citizens into a participation *straitjacket* that serves transition objectives, whether through invited formats in local energy projects or by prescribed roles promoted in policy discourses (Directive 2018/2001, 2018; Putters, 2014; Rijksoverheid, 2019).

Findings reveal that such straitjackets rarely align with how people already participate, wish to participate, or with the structural and relational conditions shaping engagement. Importantly, even when barriers are removed, people may not wish to engage in the ways envisioned by policymakers or practitioners. These insights challenge the implicit hierarchy in dominant participation approaches that prioritizes visible, institutionally recognizable engagement, while marginalizing forms occurring outside formal design. In such framings, uninvited or unstimulated engagement remains largely invisible, not because it is absent, but because prevailing frameworks are not designed to recognize it. This exposes a paradox: while policy and practice increasingly demand "more engagement," they pay insufficient attention to what is already happening.

By making these overlooked forms analytically visible this thesis nuances the binary between invited and uninvited participation, and frequently encountered 'engagement deficit'- thinking (Beauchampet & Walsh, 2021; Chilvers & Longhurst, 2016). It advances the debate by showing that participation cannot be reduced to institutional design or that roles must always be deliberately shaped. In doing so, it problematizes the normative assumption that only designed or stimulated engagement qualifies as "real" and meaningful (Pallett et al., 2019) and therefore inherently more legitimate. This matters for governance, because when policy recognizes only invited participation it risks overlooking existing practices that could support transitions. Rather than demanding more engagement within predefined formats, participatory approaches should recognize and build on existing, situated forms, even those outside the energy domain, and explore how they can be made relevant to the issues at hand, rather than requiring citizens to conform to predefined models or issues.

7.3 Engagement and empowerment

A more comprehensive engagement understanding refines debates on empowerment by challenging dominant assumptions about what empowerment means and how it relates to engagement. Traditionally within these debates, empowerment is equated with visible, active and issue-specific participation, framing active engagement in energy transitions as the hallmark of the 'empowered' citizen. This research demonstrates such framings are narrow and problematic in three ways:

First, empowerment cannot be reduced to active participation. As shown in Chapters 3 and 4, choosing *not* to engage, such as refusing to sign a heat contract, can be a meaningful enactment of agency (Kluskens et al., 2025; Kluskens & Höffken, 2026). This differs fundamentally from inactivity caused by structural barriers (Laakso et al., 2023), rather it represents a conscious exercise of agency within existing institutional structures. Recognizing inaction as agency challenges the normative ideal that active roles are the only or superior forms of empowerment.

Second, empowerment cannot be understood by focusing solely on activating citizens. Findings show that structural conditions and barriers act as mechanisms in what Chilvers and Longhurst (2016) describe as processes of enrollment into engagement enactments. These mechanisms shape whether and how people engage, revealing that debates on empowerment are too narrowly focused on activation. Meaningful engagement requires attention to the broader conditions that enable or constrain participation. Focusing only on activation risks overlooking systemic barriers and reduces empowerment to one dimension, individual activation, while a more comprehensive debate must include structural and relational factors that shape empowerment

Third, empowerment cannot be understood as domain-specific. Engagement in one domain, like energy, can compete with or detract from empowerment in other areas. Enrollments in other societal arenas outside the energy domain can influence, exclude, or compete with energy-related engagement, meaning empowerment must be seen as part of a wider system of participation.

This perspective challenges approaches that classify empowerment in strictly domain-specific terms, a trend evident in energy citizenship discourse, where empowerment and citizenship are increasingly defined though a one-issues lens (e.g., Biresselioglu et al., 2022; Pel et al., 2022; Wahlund & Palm, 2022), limiting empowerment to so called issue-publics (Marres, 2008; Marres, 2005). Such framings risk politicizing citizenship along thematic lines, implicitly prescribing not only how people should engage but also where. This narrows the meaning of empowerment, as it devalues other forms of engagement across different societal issues, implicitly defining 'good citizenship' in relation to one issue, while overlooking how people may already act as engaged citizens elsewhere.

To meaningfully evaluate empowerment in relation to engagement, analysis must extend beyond the energy transition domain and consider how people are already enrolled and enacting agency in other areas of life. Chapter 5 also reflected on how research itself can either reinforce or broaden these framings. Only by doing so, we can capture the full picture of what enables or constraints engagement, and reassess expectations about what "greater citizen engagement" in energy transitions might realistically, and justly, entail.

Overall, this thesis challenges what I refer to as dominant "fit-and-conform"[23] models of empowerment, which promote predefined ideas of empowerment and encourages people to conform to them. In contrast, it highlights the need for what I refer to as "stretch-and-reform" models, which acknowledge self-chosen pathways to empowerment aligned with individuals' own desires and areas in which they wish to be empowered.

7.4 Engagement and responsibilization

Findings on the plurality and structural conditions of engagement contribute to and nuance ongoing debates on responsibilization, particularly in marginalized contexts. Traditionally, this debate has centered on the risks of demanding *more* participation from citizens, warning that increasing participation demands may lead to overburdening, tokenism (Cooke & Kothari, 2001) or even less engagement, a dynamic described as the participation paradox (Van der Meer, 2018). This thesis expands this perspective by showing that increased participation (and related responsibility) demands is not the only risk at play, but that two opposing tensions are present.

On the one side, findings confirm longstanding concerns of over-responsibilization, particularly for vulnerable groups. As the literature shows, stimulating engagement may shift undue governance responsibilities onto citizens (Frantzeskaki et al., 2016; Thörn & Svenberg, 2016). Such shifting raises questions of accountability (Kok et al., 2021), and may serve neoliberal logics that justify state withdrawal from providing essential services and sustaining collective infrastructure, while masking ineffective governance (Williams et al., 2014). This shift risks burdening citizens with responsibilities for which they may lack the resources or institutional support, risking further inequalities within and between citizens (Frantzeskaki et al., 2016). This risk of over-responsibilization was evident in the 'responsibility vacuum' observed in Chapter 3, where a retreating local government did not lead to increased citizens engagement. Instead, neighborhood-scale energy transitions proved to be complex arenas in which citizens struggled to find and enact their position. This demonstrates that withdrawal of state responsibility, without resources or institutional support for engagement does not inherently strengthen agency or more effective collective action, particularly in more vulnerable settings.

On the other side, findings revealed risks on the other side of the spectrum: under-responsibilization (reducing participation demands), often framed as unburdening, which also has problematic sides. While scholars have argued for more context-sensitive approaches to engagement (DellaValle & Czako, 2022; Radtke, 2025) in practice, this frequently translated into a justification for limiting participation demands and opportunities, particularly in contexts where citizens facing socio-economic challenges. Although intended to protect residents from the perceived burdens of participation, findings showed that such unburdening often misses the point: unburdening did not necessarily provide the relief people needed, nor did it align with their own views of where or how they wished to be supported.

Together, these insights advance critical responsibilization debates by showing that tensions around participation in vulnerable neighborhoods do not solely lie in over-responsibilization, but also at the opposite end of the spectrum: unburdening. Moreover, it nuances that debates around participation in vulnerable neighborhoods is not a linear question and choice of more or less participation (and responsibility), because that does not do justice to the plurality of experiences, capacities and desires for engagement among vulnerable groups. The findings therefore highlight that meaningful and inclusive participation requires finding a dynamic balance in aligning with 'already there' participation, actor's wishes, and ensuring that responsibilities are matched with capacities and institutional support.

7.5 Engagement and democracy

Finally, these findings raise broader questions about democracy in relation to citizen engagement. Outcome-oriented framings, often centered on deliberative formats, frequently present engagement as a way to improve legitimacy and democracy (Michels, 2011), typically within a specific domain. This thesis nuances that view by highlighting two issues: 1) the multiplicity of participation forms and, 2) the domain-specific nature of participation demands in relation to larger societal issues.

As discussed in 7.2, participation extends beyond invited formats, people engage in many ways. Pallet et al. (2019) note that all engagement, whether invited or uninvited, is constructed and framed in partial ways, and thereby subject to exclusions. Rather than trying to eliminate exclusions, they argue for transparent acknowledgment that engagement exclusions cannot entirely be eliminated (Pallett et al., 2019). This prompts reflection on how diverse forms of engagement can coexist legitimately within democratic and institutional settings. This does not require just simply including all possible engagement formats, but critically examining the forms of enrolment through which participation is organized and paying attention to how diverse and emergent formats can be aligned with fundamental democratic principles.

At the same time, as discussed in 7.2 and 7.3, not everyone wants or is able to participate in the same way or regarding the same issues, and many are already engaged beyond the energy domain. Yet, outcome-oriented framings expect or promote domain-specific participation, particularly at the local level. This raises a key question: if participation demands concentrate in certain domains, how does that relate to representative democracy and influence in other societal issues? Is it realistic, or desirable, to expect everyone to participate in all aspects of energy transitions? Or does this risk distracting from the core democratic responsibility for decision-making and representing collective interest while protecting vulnerable groups?

When some topics invite extensive participation while others rely on representation this can create uneven influence (citizens might have more say on predefined issues than on others), self-selection and exclusion (only those willing and able to engage on that topic participate), and fragmented democratic accountability (responsibility for decision making becomes divided across topics). The risk is that certain topics appear more legitimately decided than others, producing different levels of democratic legitimacy across issues. Together these insights imply that participation should complement rather than replace representative democracy, and legitimacy requires awareness to proportionality and transparency in participation demands across domains.

7.6 Contribution to sustainability transitions scholarship

All in all, adopting a relational, embedded and processual orientation would allow sustainability transitions scholarship to deepen and refine its treatment of engagement. In this regard, the thesis advances sustainable energy transitions literature in three ways, namely conceptually, analytically, and normatively.

First, conceptually, the thesis demonstrates that rather than approaching engagement as facilitative to outcomes to be achieved, there is value in reframing citizen engagement as a relational, embedded, and evolving process. By shifting attention from how engagement leads to transition outcomes, to how it is constructed, negotiated, and stabilized in practice, it expands transitions theory's understanding of how systemic change is mediated locally. This shift does not undermine the normative and strategic ambitions of sustainability transitions research; rather, it strengthens its explanatory power by illuminating the dynamics through which change is negotiated and enacted. Integrating such a perspective would therefore not replace structural or system-level approaches, but complement them, as it connects system-level ambitions to the everyday practices through which energy transitions unfold. In doing so, it enriches ongoing discussions in sustainability transitions scholarship with greater sensitivity to relations, meaning-making, temporality, and the coexistence of multiple realities within local transformation processes (Köhler et al., 2019).

Second, analytically, the thesis demonstrates that acceptance, empowerment, and coordination are not citizen-level outcomes but multi-actor relational achievements emerging from interactions among multiple actors within specific institutional configurations. By foregrounding a relational perspective on how engagement materializes in concrete contexts, it makes visible the processes of interpretation, contestation, and enactment that shape transition processes on the ground, and thereby moves away from treating actors as stable categories and engagement outcomes as static measurable end-states (Köhler et al., 2019; Fuenfschilling & Truffer, 2016). This analytical move provides transitions scholarship with more precise insight into where transition processes gain traction and where they become constrained because of instrumental application. In doing so, it identifies more precise leverage points and avoids premature closure about what engagement is and what it (is supposed to) achieve(s).

Third, normatively, the thesis challenges the assumption that more citizen engagement automatically leads to better transitions (e.g., Köhler et al., 2019). Instead, it argues that the quality and orientation of engagement matter. Sustainable transitions are not advanced by participation alone, but by approaches to engagement that acknowledge relational dynamics, institutional embeddedness, and structural inequalities. By foregrounding these dimensions, the thesis cautions

against equating intensity of engagement with transformative change, and instead calls for more reflexive and relationally attuned engagement approaches for energy transitions. Especially when taking energy transition goals seriously, debates must remain vigilant about premature or false closure of engagement as an instrumental device for sustainable transition outcomes.

7.7 Limitations and future research

This study set out to develop a more comprehensive understanding of citizen engagement and its implications for citizen engagement in energy transitions. While the findings offer valuable insights, they also prompt reflection.

First, the qualitative case-study design is inherently local and context specific. The selected trajectories represent energy transition projects embedded in unique institutional, social, and historical environments. As discussed in Section 7.5, this raises the question of how local participation relates to larger scales and broader democratic issues. A sole focus on the local level can only partially address such questions, as it leaves multi-scalar dynamics out of the scope of this study. Future research should therefore include comparative analysis across local, regional, and national levels, or across settings with differing institutional arrangements. Such work could further distinguish context-specific participation patterns from broader mechanisms, and interrogate whether existing governance boundaries (local–regional–national) are the most meaningful scales for studying participation, or whether alternative frames would better capture its relational and dynamic nature, and its links to broader democratic processes.

Second, this study applied a more comprehensive understanding of engagement to three outcome-oriented approaches. Future research could extend this analysis to other themes with a similar outcome-oriented relationship to participation. Building on reflections in Section 7.5, energy democracy offers a particularly promising avenue. Applying this lens to energy democracy could deepen understanding on legitimacy questions surrounding participation and further unpack how participatory practices relate to broader democratic issues.

Finally, further research would benefit from practice-based investigations that can do justice to the complexity of participation, without reducing its governance to something inherently problematic. Such research could explore how diverse forms of participation can be meaningfully recognized and supported in practice, and how they relate to, and contribute to, a functioning democracy.

7.8 Recommendations

This research has demonstrated the value of an embedded, relational and procedural approach to engagement. In doing so, it challenged and theoretically contrib-

uted to outcome-oriented framings, especially those linked to acceptance, energy citizenship and, and local heat transition coordination debates. The findings reveal key ambiguities in these framings, especially when they focus on citizens alone, providing insights relevant to broader critical debates about engagement.

By exposing these ambiguities of outcome-oriented framings, this research does not argue that participation is unimportant, ineffective, or outcome-oriented framings are inherently flawed. Nor does a more comprehensive understanding of engagement imply that engagement should be so open-ended or complex that is loses practical relevance. Rather, this dissertation argues that the limitations identified call for a reorientation of participation in practice: one that recognizes the complexities of engagement, without being paralyzed by them. The central recommendation is therefore to move away from treating participation as a checklist activity or an input-output mechanism and instead approach engagement as a *practice of relating.*

This recommendation should not be read as a call for open-ended participation without direction. Rather, the contribution of this dissertation lies in reframing where meaningful intervention in engagement processes can occur, to avoid rigid engagement scripts that can inadvertently generate the very blockages they seek to prevent. In this sense, the contribution lies not primarily in prescribing a singular model of participation, but in clarifying how engagement processes can remain responsive to the relational and contextual dynamics that shape them. The proposed reorientation therefore operates at a more fundamental level: it concerns how engagement processes are understood, interpreted, and based on that, designed.

Operationalising such a reorientation thus does not lie in a single model or blueprint. Rather, it translates into procedural design principles that incorporate this embedded, relational and process orientation into engagement approaches.

Such as reorientation begins by foregrounding the relational nature of participation. Rather than designing participatory processes solely to achieve predefined outcomes, it should attend to the relational and interpersonal dynamics through which engagement unfolds, including trust building, mediating conflict, and the development of quality of relationships. In practice, this means designing engagement around relationships, not just outcomes, a dimensions that is often not accounted for in policy-practice. This implies that engagement design should not only focus on who participates and what outcomes are achieved, but also on how relationships are built and maintained throughout the process. This may involve allocating time for informal interaction, investing in facilitation that actively supports dialogue, mediates conflict, and negotiation, and creating continuity so that relationships can develop over repeated interactions rather than one-off consultations.

Approaching participation as a practice of relating also opens up space to address broader questions that surfaced with a broader understanding of engagement, like questions of empowerment, invited versus uninvited participation, responsibilization and democracy. Rather than designing participation to deliver certain outcomes, it should be treated as a space where such questions can be surfaced, negotiated, and reflected upon throughout the process. This thesis therefore, secondly, recommends designing for reflexivity in engagement practices. Practically, this can involve creating reflexive spaces that recognize multiple forms of engagement or iterative feedback rounds in which participants and organisers collectively reflect on how the process unfolds and relate to new (normative) questions that arise. Crucially, this means that reflection should occur in the moment of engagement, not only afterward, and that normative questions become embedded in the practice of participation itself rather than confined to academic debate.

This reorientation further shifts the focus away from viewing citizens as only instruments for transition outcomes, or as targets of engagement. Instead, it highlights recognizing participation as a shared practice involving multiple actors, including policy makers, experts and municipalities. This thesis therefore, thirdly, recommends that participation should be treated as a shared institutional responsibility rather than a citizen-only task. Acknowledging this perspective helps to move beyond citizen-centered framings and opens opportunities for institutional-reflection on how engagement processes are shaped, constrained and enabled. Practically, this means that institutions involved in transition approaches, such as engagement design, should also approach engagement as an introspective learning process, attending to the feedback loops between engagement strategies and engagement on the ground. This can involve cross-departmental reflection on engagement practices, training practitioners in facilitation and relational work, and creating dedicated institutional space to reflect on how engagement practices, assumptions and approaches themselves shape engagement in practice.

Finally, as engagement does not occur in isolation, it is essential to recognize how it relates to other issues, domains and contexts. This thesis therefore recommends that engagement should not be approached as a merely siloed or domain-specific exercise. Rather, it must remain responsive to the evolving and interrelated issues that define or emerge during participatory processes. This requires designing processes that allow for multiple (emerging) (potential) participation forms, the co-creation of issue frames, or the adaptation of existing frames as participation unfolds. It means staying attentive to broader social, cultural and institutional dynamics, and to the ways in which shared, collectively relatable issues or frames are identified and negotiated, rather than limiting engagement to predefined policy agendas or expert-defined problem framings. This can, for example, be facilitated through collective meaning-making exercises, as demonstrated by the Energy Fu-

tures Prep Pack. Such approaches support a more open and flexible understanding of engagement, that is attentive to multiple potential forms, perspectives and outcomes, rather than being confined to predetermined issues, goals, or measures of success.

In line with Pallet et all. (2019) and Chilvers and Longhurst (2016), this reorientation enables participation to remain dynamic, situated and evolving without losing practical relevance. It offers a way through the impasses and uncertainties evident in many outcome-oriented approaches to citizen engagement, and provides a grounded orientation by foregrounding relationships, reflexivity and plurality as core elements of participation. In doing so, it puts into practice the importance of an embedded, relational and process-understanding of engagement.

Eindnoten

22. *Power to change* Energiemobil unterwegs | Power2Change | www.power2change-energiewende.de/energiemobil

23. Inspired by terminology used in Smith, A., Raven, R., 2012. What is protective space? Reconsidering niches in transitions to sustainability. *Res. Policy* 41, 1025–1036. https://doi.org/10.1016/j.respol.2011.12.012

Bibliography

Aas, Ø., Devine-Wright, P., Tangeland, T., Batel, S., & Ruud, A. (2014). Public beliefs about high-voltage powerlines in Norway, Sweden and the United Kingdom: A comparative survey. *Energy Research & Social Science*, *2*, 30–37. https://doi.org/10.1016/J.ERSS.2014.04.012

Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., von Wehrden, H., Abernethy, P., Ives, C. D., Jager, N. W., & Lang, D. J. (2016). Leverage points for sustainability transformation. *Ambio 2016 46:1*, *46*(1), 30–39. https://doi.org/10.1007/S13280-016-0800-Y

Aitken, M. (2010). Why we still don't understand the social aspects of wind power: A critique of key assumptions within the literature. *Energy Policy*, *38*(4), 1834–1841. https://doi.org/10.1016/j.enpol.2009.11.060

Aitken, M., McDonald, S., & Strachan, P. (2008). Locating "power" in wind power planning processes: The (not so) influential role of local objectors. *Journal of Environmental Planning and Management*, *51*(6), 777–799. https://doi.org/10.1080/09640560802423566

Azungah, T. (2018). Qualitative research: deductive and inductive approaches to data analysis. *Qualitative Research Journal*, *18*(4), 383–400. https://doi.org/10.1108/QRJ-D-18-00035

Batel, S. (2020). Research on the social acceptance of renewable energy technologies: Past, present and future. *Energy Research and Social Science*, *68*, 101544. https://doi.org/10.1016/j.erss.2020.101544

Batel, S., Devine-Wright, P., & Tangeland, T. (2013). Social acceptance of low carbon energy and associated infrastructures: A critical discussion. *Energy Policy*, *58*, 1–5. https://doi.org/10.1016/J.ENPOL.2013.03.018

Batel, S., & Rudolph, D. (2021). A Critical Approach to the Social Acceptance of Renewable Energy Infrastructures. In S. Batel & D. Rudolph (Eds.), *A critical approach to the social acceptance of renewable energy infrastructures* (pp. 3–19). Palgrave Macmillan Cham. https://doi.org/10.1007/978-3-030-73699-6_1

Beauchampet, I., & Walsh, B. (2021). Energy citizenship in the Netherlands: The complexities of public engagement in a large-scale energy transition. *Energy Research & Social Science*, *76*, 102056. https://doi.org/10.1016/j.erss.2021.102056

Becker, S., Demski, C., Smith, W., & Pidgeon, N. (2023). Public perceptions of heat decarbonization in Great Britain. *Wiley Interdisciplinary Reviews: Energy and Environment*, *12*(6), 1–22. https://doi.org/10.1002/wene.492

Bertsch, V., Hall, M., Weinhardt, C., & Fichtner, W. (2016). Public acceptance and preferences related to renewable energy and grid expansion policy: Empirical insights for Germany. *Energy*, *114*, 465–477. https://doi.org/10.1016/j.energy.2016.08.022

Bevk, T., & Golobič, M. (2020). Contentious eye-catchers: Perceptions of landscapes changed by solar power plants in Slovenia. *Renewable Energy*, *152*, 999–1010. https://doi.org/10.1016/J.RENENE.2020.01.108

Bidwell, D. (2013). The role of values in public beliefs and attitudes towards commercial wind energy. *Energy Policy*, *58*, 189–199. https://doi.org/10.1016/J.ENPOL.2013.03.010

Bidwell, D. (2016). Thinking through participation in renewable energy decisions. *Nature Energy*, *1*, 16051. https://doi.org/10.1038/nenergy.2016.51

Biresselioglu, M. E., Demir, M. H., Solak, B., & Turan, U. (2022). Understanding the dynamics and conceptualization of environmental citizenship and energy citizenship: Evidence from the existing literature. *Frontiers in Energy Research*, *10*. https://doi.org/10.3389/FENRG.2022.1018035

Bögel, P. M. (2024). Citizens' perceptions. *Nature Energy*, *9*(5), 512–513. https://doi.org/10.1038/s41560-024-01513-x

Bögel, P. M., Pereverza, K., Upham, P., & Kordas, O. (2019). Linking socio-technical transition studies and organisational change management: Steps towards an integrative, multi-scale heuristic. *Journal of Cleaner Production*, *232*, 359–368. https://doi.org/10.1016/J.JCLEPRO.2019.05.286

Bronsvoort, I., Hoffman, J., & Hajer, M. (2023). *Vormgeven van inclusieve ontmoetingen in de energietransitie*. www.uu.nl/ufs.

Bryman, A. (2016). *Social Research Methods* (5th edition). Oxford university press.

Bush, R. E., Bale, C. S. E., & Taylor, P. G. (2016). Realising local government visions for developing district heating: Experiences from a learning country. *Energy Policy*, *98*, 84–96. https://doi.org/10.1016/j.enpol.2016.08.013

Busse, M., & Siebert, R. (2018). Acceptance studies in the field of land use—A critical and systematic review to advance the conceptualization of acceptance and acceptability. *Land Use Policy*, *76*, 235–245. https://doi.org/10.1016/J.LANDUSEPOL.2018.05.016

Carrión, D., Victoria Lee, W., & Hernández, D. (2018). Residual inequity: Assessing the unintended consequences of new york city's clean heat transition. *International Journal of Environmental Research and Public Health*, *15*(117), 1–16. https://doi.org/10.3390/ijerph15010117

Chilvers, J., Bellamy, R., Pallett, H., & Hargreaves, T. (2021). A systemic approach to mapping participation with low-carbon energy transitions. *Nature Energy*, *6*(3), 250–259. https://doi.org/10.1038/s41560-020-00762-w

Chilvers, J., & Kearnes, M. (2020). Remaking Participation in Science and Democracy. *Science Technology and Human Values*, *45*(3), 347–380. https://doi.org/10.1177/0162243919850885

Chilvers, J., & Longhurst, N. (2016). Participation in transition(s): Reconceiving public engagements in energy transitions as co-produced, emergent and diverse. *Journal of Environmental Policy and Planning*, *18*(5), 585–607. https://doi.org/10.1080/1523908X.2015.1110483

Chilvers, J., Pallett, H., & Hargreaves, T. (2018). Ecologies of participation in socio-technical change: The case of energy system transitions. *Energy Research and Social Science*, *42*, 199–210. https://doi.org/10.1016/j.erss.2018.03.020

Cooke, B., & Kothari, U. (2001). *Participation: The New Tyranny?* (B. Cooke & U. Kothari, Eds.; 4th edition). Zed Books.

Coops, F., Bogner, K., & Hummels, C. (2024). Letting Go in Sustainability Transitions: Designing Spaces for the Unavoidable Companion of Change. *Routledge Handbook of Sustainable Design*, 493–504. https://doi.org/10.4324/9781003365433-38

Cowell, R., Bristow, G., & Munday, M. (2011). Acceptance, acceptability and environmental justice: the role of community benefits in wind energy development. *Journal of Environmental Planning and Management*, *54*(4), 539–557. https://doi.org/10.1080/09640568.2010.521047

Creswell, J. W., & Creswell, D. J. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches.* (Fifth edit). SAGE Publications.

Dällenbach, N., & Wüstenhagen, R. (2022). How far do noise concerns travel? Exploring how familiarity and justice shape noise expectations and social acceptance of planned wind energy projects. *Energy Research and Social Science*, *87*, 102300. https://doi.org/10.1016/j.erss.2021.102300

de Wildt, T. E., Boijmans, A. R., Chappin, E. J. L., & Herder, P. M. (2021). An ex ante assessment of value conflicts and social acceptance of sustainable heating systems: An agent-based modelling approach. *Energy Policy*, *153*. https://doi.org/10.1016/j.enpol.2021.112265

Debourdeau, A., Schäfer, M., Pel, B., Kemp, R., & Vadovics, E. (2024). A conceptual typology of energy citizenship. *Energy Research & Social Science*, *117*, 103720. https://doi.org/10.1016/J.ERSS.2024.103720

DellaValle, N., & Czako, V. (2022). Empowering energy citizenship among the energy poor. *Energy Research and Social Science*, *89*, 102654. https://doi.org/10.1016/j.erss.2022.102654

Dermont, C., Ingold, K., Kammermann, L., & Stadelmann-Steffen, I. (2017). Bringing the policy making perspective in: A political science approach to social acceptance. *Energy Policy*, *108*, 359–368. https://doi.org/10.1016/j.enpol.2017.05.062

Devine-Wright, P. (2007a). Energy Citizenship: Psychological Aspects of Evolution in Sustainable Energy Technologies. In J. Murphy (Ed.), *Governing Technology for Sustainability* (1st edition, pp. 63–86). Routledge.

Devine-Wright, P. (2007b). Reconsidering public attitudes and public acceptance of renewable energy technologies: a critical review. In T. Jamasb, M. Grubb, & M. Pollitt (Eds.), *Delivering a Low Carbon Electricity System: Technologies, Economics and Policy* (Issue February, pp. 1–15). Cambridge University Press.

Devine-Wright, P. (2011). Public engagement with large-scale renewable energy technologies: breaking the cycle of NIMBYism. *Wiley Interdisciplinary Reviews: Climate Change*, *2*(1), 19–26. https://doi.org/10.1002/WCC.89

Devine-Wright, P. (2017). Environment, Democracy, and Public Participation. In *International Encyclopedia of Geography: People, the Earth, Environment and Technology* (pp. 1–10). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118786352.wbieg0613

Directive 2018/2001. (2018). *Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources.* http://data.europa.eu/eli/dir/2018/2001/oj

Dominelli, L. (2014). Problematising Concepts of Citizenship and Citizenship Practices. In L. Dominelli & M. Moosa-Mitha (Eds.), *Reconfiguring Citizenship: Social Exclusion and Diversity within Inclusive Citizenship Practices*. Ashgate.

Dubois, G., Sovacool, B., Aall, C., Nilsson, M., Barbier, C., Herrmann, A., Bruyère, S., Andersson, C., Skold, B., Nadaud, F., Dorner, F., Moberg, K. R., Ceron, J. P., Fischer, H., Amelung, D., Baltruszewicz, M., Fischer, J., Benevise, F., Louis, V. R., & Sauerborn, R. (2019). It starts at home? Climate policies targeting household consumption and behavioral decisions are key to low-carbon futures. *Energy Research & Social Science*, *52*, 144–158. https://doi.org/10.1016/J.ERSS.2019.02.001

Dunphy, N. P., Lennon, B., Revez, A., & Pearce, B. B. J. (2024). Energy citizenship: Envisioning citizens' participation in the energy system. In N. P. Dunphy, B. Lennon, A. Revez, & B. B. J. Pearce (Eds.), *Energy Citizenship: Envisioning Citizens' Participation in the Energy System*. Palgrave Macmillan. https://doi.org/10.1007/978-3-031-70153-5

Ellis, G., Barry, J., & Robinson, C. (2007). Many ways to say 'no', different ways to say 'yes': Applying Q-Methodology to understand public acceptance of wind farm proposals. *Journal of Environmental Planning and Management*, *50*(4), 517–551. https://doi.org/10.1080/09640560701402075

Ellis, G., & Ferraro, G. (2016). The social acceptance of wind energy. In *European Commission-JRC Science for Policy Report-EUR 28182 EN*. https://doi.org/10.2789/696070

European Commission. (2019). *Clean energy for all Europeans* (D.-G. for Energy;, Ed.). Publications Office. https://doi.org/doi/10.2833/9937

Fahy, F., & Vadovics, E. (2025). *Energy Citizenship Across Europe: Contexts and Conditions for an Emerging Energy Transition* (F. Fahy & E. Vadovics, Eds.). Springer Nature. https://doi.org/10.1007/978-3-031-70157-3

Fischer, J., & Riechers, M. (2019). A leverage points perspective on sustainability. *People and Nature*, *1*(1), 115–120. https://doi.org/10.1002/PAN3.13

Frantzeskaki, N., Dumitru, A., Anguelovski, I., Avelino, F., Bach, M., Best, B., Binder, C., Barnes, J., Carrus, G., Egermann, M., Haxeltine, A., Moore, M. L., Mira, R. G., Loorbach, D., Uzzell, D., Omman, I., Olsson, P., Silvestri, G., Stedman, R., … Rauschmayer, F. (2016). Elucidating the changing roles of civil society in urban sustainability transitions. *Current Opinion in Environmental Sustainability*, *22*, 41–50. https://doi.org/10.1016/J.COSUST.2017.04.008

Fuenfschilling, L., & Truffer, B. (2014). The structuration of socio-technical regimes - Conceptual foundations from institutional theory. *Research Policy*, *43*(4), 772–791. https://doi.org/10.1016/j.respol.2013.10.010

Fuenfschilling, L., & Truffer, B. (2016). The interplay of institutions, actors and technologies in socio-technical systems - An analysis of transformations in the Australian urban water sector. *Technological Forecasting and Social Change*, *103*, 298–312. https://doi.org/10.1016/j.techfore.2015.11.023

Furtado, J., Sheedy, A., & Pearson, M. (2019). *Uncomfortable Home Truths - Why Britain Urgently Needs a Low Carbon Heat Strategy Future Gas Series Part 3*. https://www.h2knowledgecentre.com/content/policypaper84

Gerring, J. (2004). What Is a Case Study and What Is It Good for? *American Political Science Review*, *98*(2), 341–354. https://doi.org/10.1017/S0003055404001182

Grandin, J., & Sareen, S. (2020). What sticks? Ephemerality, permanence and local transition pathways. *Environmental Innovation and Societal Transitions*, *36*, 72–82. https://doi.org/10.1016/J.EIST.2020.04.008

Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E. R., & Lounsbury, M. (2011). Institutional complexity and organizational responses. *Academy of Management Annals*, *5*(1), 317–371. https://doi.org/10.1080/19416520.2011.590299

Gross, C. (2007). Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance. *Energy Policy*, *35*(5), 2727–2736. https://doi.org/10.1016/J.ENPOL.2006.12.013

Herreras Martínez, S., Harmsen, R., Menkveld, M., Faaij, A., & Kramer, G. J. (2022). Municipalities as key actors in the heat transition to decarbonise buildings: Experiences from local planning and implementation in a learning context. *Energy Policy*, *169*, 113169. https://doi.org/10.1016/j.enpol.2022.113169

Herreras Martinez, S., Harmsen, R., Menkveld, M., Kramer, G. J., & Faaij, A. (2023). Why go public? Public configurations and the supportive and divergent views towards public district heating in the Netherlands. *Frontiers in Sustainable Cities*, *5*, 1220884. https://doi.org/10.3389/frsc.2023.1220884

Huijts, N. M. A., Molin, E. J. E., & Steg, L. (2012). Psychological factors influencing sustainable energy technology acceptance: A review-based comprehensive framework. *Renewable and Sustainable Energy Reviews*, *16*(1), 525–531. https://doi.org/10.1016/J.RSER.2011.08.018

Huijts, N. M. A., Vries, G. de, & Molin, E. J. E. (2019). A positive shift in the public acceptability of a low-carbon energy project after implementation: The case of a hydrogen fuel station. *Sustainability (Switzerland)*, *11*(8), 2220. https://doi.org/10.3390/su11082220

International Energy Agency. (n.d.). *Buildings; heating*. Retrieved June 3, 2025, from https://www.iea.org/energy-system/buildings/heating#tracking

IPCC. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. https://doi.org/10.1017/9781009325844

Isin, E. F., & Turner, B. S. (2007). Investigating citizenship: An agenda for citizenship studies. *Citizenship Studies*, *11*(1), 5–17. https://doi.org/10.1080/13621020601099773

Jasanoff, S. (2018). Just transitions: A humble approach to global energy futures. *Energy Research and Social Science*, *35*, 11–14. https://doi.org/10.1016/j.erss.2017.11.025

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. *Energy Research & Social Science*, *11*, 174–182. https://doi.org/10.1016/J.ERSS.2015.10.004

Jones, C. R., & Eiser, J. R. (2009). Identifying predictors of attitudes towards local onshore wind development with reference to an English case study. *Energy Policy*, *37*(11), 4604–4614. https://doi.org/10.1016/J.ENPOL.2009.06.015

Kluskens, N., Alkemade, F., & Höffken, J. (2024). Beyond a checklist for acceptance: understanding the dynamic process of community acceptance. *Sustainability Science*, *19*(3), 831–846. https://doi.org/10.1007/S11625-024-01468-8/TABLES/3

Kluskens, N. T.T.M., & Höffken, J. I. (2026). From tension to transformation in Dutch heat transitions: Leveraging time, transparency, and relationships. *Energy Research & Social Science*, 134, 104626.

Kluskens, N., Höffken, J., & Alkemade, F. (2025). Exploring opportunities and limits of energy citizenship in Dutch heat transitions. *Energy Research & Social Science*, *127*, 104184. https://doi.org/10.1016/J.ERSS.2025.104184

Kluskens, N., Vasseur, V., & Benning, R. (2019). Energy justice as part of the acceptance of wind energy: An analysis of Limburg in the Netherlands. *Energies*, *12*(22), 4382. https://doi.org/10.3390/en12224382

Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M. S., … Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions*, *31*(January), 1–32. https://doi.org/10.1016/j.eist.2019.01.004

Kok, K. P. W., Gjefsen, M. D., Regeer, B. J., & Broerse, J. E. W. (2021). Unraveling the politics of 'doing inclusion' in transdisciplinarity for sustainable transformation. *Sustainability Science 2021 16:6*, *16*(6), 1811–1826. https://doi.org/10.1007/S11625-021-01033-7

Kokkinos, K., Lakioti, E., Papageorgiou, E., Moustakas, K., & Karayannis, V. (2018). Fuzzy cognitive map-based modeling of social acceptance to overcome uncertainties in establishing waste biorefinery facilities. *Frontiers in Energy Research*, *6*, 112. https://doi.org/10.3389/FENRG.2018.00112/BIBTEX

Küpers, S., & Batel, S. (2023). Time, history and meaning-making in research on people's relations with renewable energy technologies (RETs)-A conceptual proposal. *Energy Policy*, *173*, 113358. https://doi.org/10.1016/j.enpol.2022.113358

Laakso, S., Eranti, V., & Lukkarinen, J. (2023). Practices and acts of energy citizenship. *Journal of Environmental Policy and Planning*, *25*(6), 690–702. https://doi.org/10.1080/1523908X.2023.2251915

Landeta-Manzano, B., Arana-Landín, G., Calvo, P. M., & Heras-Saizarbitoria, I. (2018). Wind energy and local communities: A manufacturer's efforts to gain acceptance. *Energy Policy*, *121*, 314–324. https://doi.org/10.1016/j.enpol.2018.05.034

Langer, K., Decker, T., & Menrad, K. (2017). Public participation in wind energy projects located in Germany: Which form of participation is the key to acceptance? *Renewable Energy*, *112*, 63–73. https://doi.org/10.1016/J.RENENE.2017.05.021

Larson, E. C., & Krannich, R. S. (2016). "A Great Idea, Just Not Near Me!" Understanding Public Attitudes About Renewable Energy Facilities. *Society and Natural Resources*, *29*(12), 1436–1451. https://doi.org/10.1080/08941920.2016.1150536

Lawrence, T., & Suddaby, R. (2006). Institutions and institutional work. In *The sage handbook of organizational studies* (pp. 215–254). Sage Publications.

Leach, M., Scoones, I., & Wynne, B. (2005). *Science and citizens: Globalization and the challenge of engagement* (M. Leach, I. Scoones, & B. Wynne, Eds.; Vol. 2). Zed Books.

Leer Jørgensen, M., Anker, H. T., & Lassen, J. (2020). Distributive fairness and local acceptance of wind turbines: The role of compensation schemes. *Energy Policy*, *138*, 111294. https://doi.org/10.1016/J.ENPOL.2020.111294

Lennon, B., Dunphy, N., Gaffney, C., Revez, A., Mullally, G., & O'Connor, P. (2020). Citizen or consumer? Reconsidering energy citizenship. *Journal of Environmental Policy and Planning*, *22*(2), 184–197. https://doi.org/10.1080/1523908X.2019.1680277

Lennon, B., & Dunphy, N. P. (2023). Energy and Citizenship in a Time of Transition and Socio-technical Change. In R. Baikady, S. M. Sajid, V. Nadesan, & J. Przeperski (Eds.), *The Palgrave Handbook of Global Social Change*. Palgrave Macmillan Cham. https://doi.org/10.1007/978-3-030-87624-1_223-1

Lindström, K., Jönsson, L., & Hillgren, A. (2024). Reorientations: Practicing Grief and Hope in Post-Carbon Futures. In V. D'Andrea & R. Abreu de Paula (Eds.), *Proceedings of the Participatory Design Conference 2024*. Association for Computing Machinery. https://doi.org/10.1145/3666094.3666104

Lindström, K., Li, J., & Hillgren, P.-A. (2025). Sketching hope and grief in transition: Situating anticipation in lived futures. *Journal of Design Practice*, *53*(2), 17–18. https://doi.org/10.1386/art_00017_1

Liu, L., Bouman, T., Perlaviciute, G., & Steg, L. (2019). Effects of trust and public participation on acceptability of renewable energy projects in the Netherlands and China. *Energy Research & Social Science*, *53*, 137–144. https://doi.org/10.1016/J.ERSS.2019.03.006

Lockwood, M., & Devenish, A. (2024). Institutional context and the governance of heat transitions: The cases of the Netherlands and the UK. *Environmental Innovation and Societal Transitions*, *50*, 100818. https://doi.org/10.1016/J.EIST.2024.100818

Lowes, R., & Woodman, B. (2020). Disruptive and uncertain: Policy makers' perceptions on UK heat decarbonisation. *Energy Policy*, *142*, 111494. https://doi.org/10.1016/j.enpol.2020.111494

Lund, H., Möller, B., Mathiesen, B. V., & Dyrelund, A. (2010). The role of district heating in future renewable energy systems. *Energy*, *35*(3), 1381–1390. https://doi.org/10.1016/j.energy.2009.11.023

Marres, N. (2008). The Making of Climate Publics: Eco-homes as Material Devices of Publicity. *Distinktion: Scandinavian Journal of Social Theory*, *9*(1), 27–45. https://doi.org/10.1080/1600910X.2008.9672954

Marres, N. S. (2005). No issue, no public: democratic deficits after the displacement of politics [PhD thesis, Universiteit van Amsterdam]. In *Ipskamp Printparners*. No-issue-no-public-democratic-deficits-after-the-displacement-of-politics.pdf

Michels, A. (2011). Innovations in democratic governance: How does citizen participation contribute to a better democracy? *International Review of Administrative Sciences*, *77*(2), 275–293. https://doi.org/10.1177/0020852311399851

Miller, C. A., Iles, A., & Jones, C. F. (2013). The Social Dimensions of Energy Transitions. *Science as Culture*, *22*(2), 135–148. https://doi.org/10.1080/09505431.2013.786989

Mjahed Hammami, S., Chtourou, S., & Al Moosa, H. (2018). A holistic approach to understanding the acceptance of a community-based renewable energy project: A pathway to sustainability for Tunisia's rural region. *Business Strategy and the Environment*, *27*(8), 1535–1545. https://doi.org/10.1002/BSE.2211

Mundaca, L., Busch, H., & Schwer, S. (2018). 'Successful' low-carbon energy transitions at the community level? An energy justice perspective. *Applied Energy*, *218*, 292–303. https://doi.org/10.1016/J.APENERGY.2018.02.146

Nguyen, M. T., & Batel, S. (2024). Which energy citizenship in positive energy districts? A governmentality social psychological analysis of participatory governance. *Journal of Environmental Policy & Planning*, *26*(1), 117–130. https://doi.org/10.1080/1523908X.2023.2291386

NLPW. (2022). *Meerjarenprogrammaplan 2023 – 2025*. https://www.nplw.nl/uploads/files/Over-NPLW/NPLW-Meerjarenplan.pdf

NPRES. (2021). *Handreiking Regionale Energiestratie 2.0*. https://regionale-energiestrategie.nl/ondersteuning/handreiking2/2049228.aspx

Onencan, A. M., Ou, J., & de Koning, J. I. J. C. (2024). Social acceptance of district heating: evidence from the Netherlands. *Sustainability Science*, *19*(3), 815–830. https://doi.org/10.1007/S11625-023-01452-8/FIGURES/6

Otchere-Darko, W., Crilly, · Michael, Jenkinson, T., Harper, C., Ingall-Tombs, E., Bryson-Harris, E., Ritchie, E., Siu, R., Wightman, S., & Kearns, A. (2025). Planning sustainable heat networks: governance and sociotechnical practices in Northeast England. *Sustainability Science 2025*, 1–19. https://doi.org/10.1007/S11625-025-01716-5

Pallett, H., Chilvers, J., & Hargreaves, T. (2019). Mapping participation: A systematic analysis of diverse public participation in the UK energy system. *Environment and Planning E: Nature and Space*, *2*(3), 590–616. https://doi.org/10.1177/2514848619845595

Pel, B., Debourdeau, A., Kemp, R., & Dumitru, A. (2022). Energy Citizenship; Ideals, Ideology and Ideal types in the Energy Transition. *Proceedings of the European Forum for Studies of Policies for Research and Innovation (EU-SPRI)*, *101022492*, 1–19.

Pel, B., & Huhnt, J. (2025). Energy Citizenship in Belgium: Potentials and Paradoxes. In F. Fahy & E. Vadovics (Eds.), *Energy Citizenship Across Europe: Contexts and Conditions for an Emerging Energy Transition*. Palgrave Macmillan.

Perlaviciute, G., Schuitema, G., Devine-Wright, P., & Ram, B. (2018). At the heart of a sustainable energy transition: The public acceptability of energy projects. *IEEE Power and Energy Magazine*, *16*(1), 49–55. https://doi.org/10.1109/MPE.2017.2759918

Perlaviciute, G., & Squintani, L. (2020). Public Participation in Climate Policy Making: Toward Reconciling Public Preferences and Legal Frameworks. *One Earth*, *2*(4), 341–348. https://doi.org/10.1016/j.oneear.2020.03.009

Peterson, T. R., Stephens, J. C., & Wilson, E. J. (2015). Public perception of and engagement with emerging low-carbon energy technologies: A literature review. *MRS Energy & Sustainability*, *2*(1), 1–14. https://doi.org/10.1557/MRE.2015.12

Petrova, M. A. (2013). NIMBYism revisited: Public acceptance of wind energy in the United States. In *Wiley Interdisciplinary Reviews: Climate Change* (Vol. 4, Issue 6, pp. 575–601). John Wiley & Sons, Ltd. https://doi.org/10.1002/wcc.250

Phillippi, J., & Lauderdale, J. (2017). A Guide to Field Notes for Qualitative Research: Context and Conversation. *Qualitative Health Research*, *28*(3), 381–388. https://doi.org/10.1177/1049732317697102

Putters, K. (2014). *Rijk geschakeerd: Op weg naar de participatiesamenleving*. Sociaal en Cultureel Planbureau (SCP).

QSR International Pty Ltd. (2018). Nvivo.

Radtke, J. (2025). Barriers and benefits of public participation in energy transitions: A meta-analysis of empirical evidence from Central Europe. *Renewable and Sustainable Energy Reviews*, *221*, 115693. https://doi.org/10.1016/J.RSER.2025.115693

Radtke, J., Drewing, E., Eichenauer, E., Holstenkamp, L., Kamlage, J. H., Mey, F., Warode, J., & Wegener, J. (2020). Energy transition and civic engagement. *The Role of Public Participation in Energy Transitions*, 81–91. https://doi.org/10.1016/B978-0-12-819515-4.00004-0

Rasch, E. D., & Köhne, M. (2016). Hydraulic fracturing, energy transition and political engagement in the Netherlands: The energetics of citizenship. *Energy Research & Social Science*, *13*, 106–115. https://doi.org/10.1016/j.erss.2015.12.014

Reda, F., Ruggiero, S., Auvinen, K., & Temmes, A. (2021). Towards low-carbon district heating: Investigating the socio-technical challenges of the urban energy transition. *Smart Energy*, *4*, 100054. https://doi.org/10.1016/J.SEGY.2021.100054

Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C. H., & Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management*, *90*(5), 1933–1949. https://doi.org/10.1016/j.jenvman.2009.01.001

Regulation 2018/1999. (2018). *Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action*. https://eur-lex.europa.eu/eli/reg/2018/1999/oj/eng

Reidl, K., & Wüstenhagen, R. (2025). Decarbonising the rental housing market: An experimental analysis of tenants' preferences for clean energy features of residential buildings. *Energy Policy*, *198*, 114472. https://doi.org/10.1016/j.enpol.2024.114472

Rijkdienst voor Ondernemend Nederland. (2024). *NLPW*. https://www.nplw.nl/strategieuitvoering/proeftuinen/default.aspx

Rijksoverheid. (2019). *Klimaatakkoord*. https://www.rijksoverheid.nl/documenten/rapporten/2019/06/28/klimaatakkoord

Rodhouse, T. S. G. H., Pesch, U., Cuppen, E. H. W. J., & Correljé, A. F. (2021). Public agency and responsibility in energy governance: A Q study on diverse imagined publics in the Dutch heat transition. *Energy Research & Social Science*, *77*, 102046. https://doi.org/10.1016/J.ERSS.2021.102046

Rosenbloom, D. (2017). Pathways: An emerging concept for the theory and governance of low-carbon transitions. *Global Environmental Change*, *43*, 37–50. https://doi.org/10.1016/J.GLOENVCHA.2016.12.011

Ryan, S. E., Hebdon, C., & Dafoe, J. (2014). Energy research and the contributions of the social sciences: A contemporary examination. *Energy Research & Social Science*, *3*(C), 186–197. https://doi.org/10.1016/J.ERSS.2014.07.012

Ryghaug, M., Skjølsvold, T. M., & Heidenreich, S. (2018). Creating energy citizenship through material participation. *Social Studies of Science*, *48*(2), 283–303. https://doi.org/10.1177/0306312718770286

Saldaña, J. (2016). The Coding Manual for Qualitative Researchers. In J. Seaman (Ed.), *SAGE Publications Ltd*. SAGE Publications Ltd.

Schlindwein, L. F., & Montalvo, C. (2023). Energy citizenship: Accounting for the heterogeneity of human behaviours within energy transition. *Energy Policy*, *180*, 113662. https://doi.org/10.1016/J.ENPOL.2023.113662

Schmidt, D., Kallert, A., Blesl, M., Svendsen, S., Li, H., Nord, N., & Sipilä, K. (2017). Low Temperature District Heating for Future Energy Systems. *Energy Procedia*, *116*, 26–38. https://doi.org/10.1016/J.EGYPRO.2017.05.052

Scholte, S., Van Der Kooij, P., De Vries, R., & Van Der Wouden, R. (2024). *Het waarom van de wijkaanpak in de warmtetransitie: verschillende discoursen over de wijkaanpak in het rijksbeleid*.

Schot, J., Kanger, L., & Verbong, G. (2016). The roles of users in shaping transitions to new energy systems. *Nature Energy*, *1*. https://doi.org/10.1038/NENERGY.2016.54

Segreto, M., Principe, L., Desormeaux, A., Torre, M., Tomassetti, L., Tratzi, P., Paolini, V., & Petracchini, F. (2020). Trends in Social Acceptance of Renewable Energy Across Europe—A Literature Review. *International Journal of Environmental Research and Public Health*, *17*(24), 9161. https://doi.org/10.3390/IJERPH17249161

Shirani, F., Thomas, G. H., Pidgeon, N., & Henwood, K. (2024). Going backwards? A temporal perspective of what constitutes improvement in domestic heating transitions. *Sustainability: Science, Practice, and Policy*, *20*(1), 2347075. https://doi.org/10.1080/15487733.2024.2347075

Shove, E., & Walker, G. (2014). What Is Energy For? Social Practice and Energy Demand. *Culture & Society*, *31*(5), 41–58. https://doi.org/10.1177/0263276414536746

Silvast, A., & Valkenburg, G. (2023). Energy citizenship: A critical perspective. *Energy Research & Social Science*, *98*, 102995. https://doi.org/10.1016/J.ERSS.2023.102995

Smink, M., Negro, S. O., Niesten, E., & Hekkert, M. P. (2015). How mismatching institutional logics hinder niche–regime interaction and how boundary spanners intervene. *Technological Forecasting and Social Change*, *100*, 225–237. https://doi.org/10.1016/J.TECHFORE.2015.07.004

Soma, K., & Haggett, C. (2015). Enhancing social acceptance in marine governance in Europe. *Ocean & Coastal Management*, *117*, 61–69. https://doi.org/10.1016/J.OCECOAMAN.2015.11.001

Sovacool, B. K., & Martiskainen, M. (2020). Hot transformations: Governing rapid and deep household heating transitions in China, Denmark, Finland and the United Kingdom. *Energy Policy*, *139*, 111330. https://doi.org/10.1016/j.enpol.2020.111330

Stadelmann-Steffen, I., & Dermont, C. (2021). Acceptance through inclusion? Political and economic participation and the acceptance of local renewable energy projects in Switzerland. *Energy Research & Social Science*, *71*, 101818. https://doi.org/10.1016/J.ERSS.2020.101818

Stenekes, N., Colebatch, H. K., Waite, T. D., & Ashbolt, N. J. (2016). Risk and Governance in Water Recycling: Public Acceptance Revisited. *Science Technology and Human Values*, *31*(2), 107–134. https://doi.org/10.1177/0162243905283636

Stirling, A., Smith, A., Leach, M., Pellizzoni, L., Levidow, L., Hendriks, C., Owens, S., von Tunzelmann, N., & Wynne, B. (2008). "Opening Up" and "Closing Down": Power, Participation, and Pluralism in the Social Appraisal of Technology. *Science, Technology, & Human Values*, *33*(2), 262–294. https://doi.org/10.1177/0162243907311265

Suškevičs, M., Eiter, S., Martinat, S., Stober, D., Vollmer, E., de Boer, C. L., & Buchecker, M. (2019). Regional variation in public acceptance of wind energy development in Europe: What are the roles of planning procedures and participation? *Land Use Policy*, *81*, 311–323. https://doi.org/10.1016/J.LANDUSEPOL.2018.10.032

Sütterlin, B., & Siegrist, M. (2017). Public acceptance of renewable energy technologies from an abstract versus concrete perspective and the positive imagery of solar power. *Energy Policy*, *106*, 356–366. https://doi.org/10.1016/J.ENPOL.2017.03.061

Teladia, A., & van der Windt, H. (2024). Citizen participation gaps and challenges in the heating transition: Learning from Dutch community initiatives. *Renewable and Sustainable Energy Reviews*, *189*, 113975. https://doi.org/10.1016/J.RSER.2023.113975

Thomas, G. H., Flower, J., Gross, R., Henwood, K., Shirani, F., Speirs, J., & Pidgeon, N. (2024). A relational approach to characterizing householder perceptions of disruption in heat transitions. *Nature Energy*, *9*(5), 570–579. https://doi.org/10.1038/s41560-024-01506-w

Thörn, H., & Svenberg, S. (2016). 'We feel the responsibility that you shirk': movement institutionalization, the politics of responsibility and the case of the Swedish environmental movement. *Social Movement Studies*, *15*(6), 593–609. https://doi.org/10.1080/14742837.2016.1213162;ISSUE:ISSUE:-DOI

Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). The Institutional Logics Perspective. In *The institutional logics perspective: A new approach to culture, structure, and process*. Oxford University Press.

United Nations. (2015). *Paris Agreement*. https://unfccc.int/sites/default/files/english_paris_agreement.pdf

Upreti, B. R., & Van Der Horst, D. (2004). National renewable energy policy and local opposition in the UK: the failed development of a biomass electricity plant. *Biomass and Bioenergy*, *26*(1), 61–69. https://doi.org/10.1016/S0961-9534(03)00099-0

van de Grift, E., & Cuppen, E. (2022). Beyond the public in controversies: A systematic review on social opposition and renewable energy actors. *Energy Research & Social Science*, *91*, 102749. https://doi.org/10.1016/J.ERSS.2022.102749

Van der Meer, T. (2018). *De participatie-elite en de participatieparadox* . https://stukroodvlees.nl/de-participatie-elite-en-de-participatieparadox/

Van Rijnsoever, F. J., Van Mossel, A., & Broecks, K. P. F. (2015). Public acceptance of energy technologies: The effects of labeling, time, and heterogeneity in a discrete choice experiment. *Renewable and Sustainable Energy Reviews*, *45*, 817–829. https://doi.org/10.1016/J.RSER.2015.02.040

Vihalemm, T., & Keller, M. (2016). Consumers, citizens or citizen-consumers? Domestic users in the process of Estonian electricity market liberalization. *Energy Research & Social Science*, *13*, 38–48. https://doi.org/10.1016/J.ERSS.2015.12.004

Wahlund, M., & Palm, J. (2022). The role of energy democracy and energy citizenship for participatory energy transitions: A comprehensive review. *Energy Research and Social Science*, *87*, 102482. https://doi.org/10.1016/j.erss.2021.102482

Walker, G., & Cass, N. (2007). Carbon reduction, 'the public' and renewable energy: engaging with socio-technical configurations. *Area*, *39*(4), 458–469. https://doi.org/10.1111/J.1475-4762.2007.00772.X

Walker, G., Devine-Wright, P., Barnett, J., Burningham, K., Cass, N., Devine-Wright, H., Speller, G., Barton, J., Evans, B., Heath, Y., Infield, D., Parks, J., & Theobald, K. (2013). Symmetries, expectations, dynamics and contexts: A framework for understanding public engagement with renewable energy projects. In *Renewable Energy and the Public: From NIMBY to Participation* (pp. 1–14). Taylor and Francis. https://doi.org/10.4324/9781849776707

Warren, C. R., & McFadyen, M. (2010). Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland. *Land Use Policy*, *27*(2), 204–213. https://doi.org/10.1016/J.LANDUSEPOL.2008.12.010

Whitmarsh, L., Xenias, D., & Jones, C. R. (2019). Framing effects on public support for carbon capture and storage. *Palgrave Communications*, *5*(1), 1–10. https://doi.org/10.1057/s41599-019-0217-x

Wiersma, B., & Devine-Wright, P. (2014). Public engagement with offshore renewable energy: A critical review. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(4), 493–507. https://doi.org/10.1002/wcc.282

Williams, A., Goodwin, M., & Cloke, P. (2014). Neoliberalism, Big Society, and progressive localism. *Environment and Planning A*, *46*(12), 2798–2815. https://doi.org/10.1068/A130119P

Windemer, R. (2023). Acceptance should not be assumed. How the dynamics of social acceptance changes over time, impacting onshore wind repowering. *Energy Policy*, *173*(113363). https://doi.org/10.1016/J.ENPOL.2022.113363

Wittmayer, J. M., Avelino, F., van Steenbergen, F., & Loorbach, D. (2017). Actor roles in transition: Insights from sociological perspectives. *Environmental Innovation and Societal Transitions*, *24*, 45–56. https://doi.org/10.1016/J.EIST.2016.10.003

Wolsink, M. (2007a). Planning of renewables schemes: Deliberative and fair decision-making on landscape issues instead of reproachful accusations of non-cooperation. *Energy Policy*, *35*(5), 2692–2704. https://doi.org/10.1016/J.ENPOL.2006.12.002

Wolsink, M. (2007b). Wind power implementation: The nature of public attitudes: Equity and fairness instead of "backyard motives." In *Renewable and Sustainable Energy Reviews* (Vol. 11, Issue 6, pp. 1188–1207). Pergamon. https://doi.org/10.1016/j.rser.2005.10.005

Wolsink, M. (2010). Contested environmental policy infrastructure: Socio-political acceptance of renewable energy, water, and waste facilities. *Environmental Impact Assessment Review*, *30*(5), 302–311. https://doi.org/10.1016/j.eiar.2010.01.001

Wolsink, M. (2012). Wind power: Basic challenge concerning social acceptance. In *Renewable Energy Systems* (Springer, pp. 1785–1821).

Wolsink, M. (2018). Social acceptance revisited: gaps, questionable trends, and an auspicious perspective. *Energy Research and Social Science*, *46*, 287–295. https://doi.org/10.1016/j.erss.2018.07.034

Wood, N., & Roelich, K. (2019). Tensions, capabilities, and justice in climate change mitigation of fossil fuels. *Energy Research & Social Science*, *52*, 114–122. https://doi.org/10.1016/J.ERSS.2019.02.014

Wüstenhagen, R., Wolsink, M., & Bürer, M. J. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. *Energy Policy*, *35*(5), 2683–2691. https://doi.org/10.1016/j.enpol.2006.12.001

Appendices

A: Figure of factors hampering or facilitating acceptance

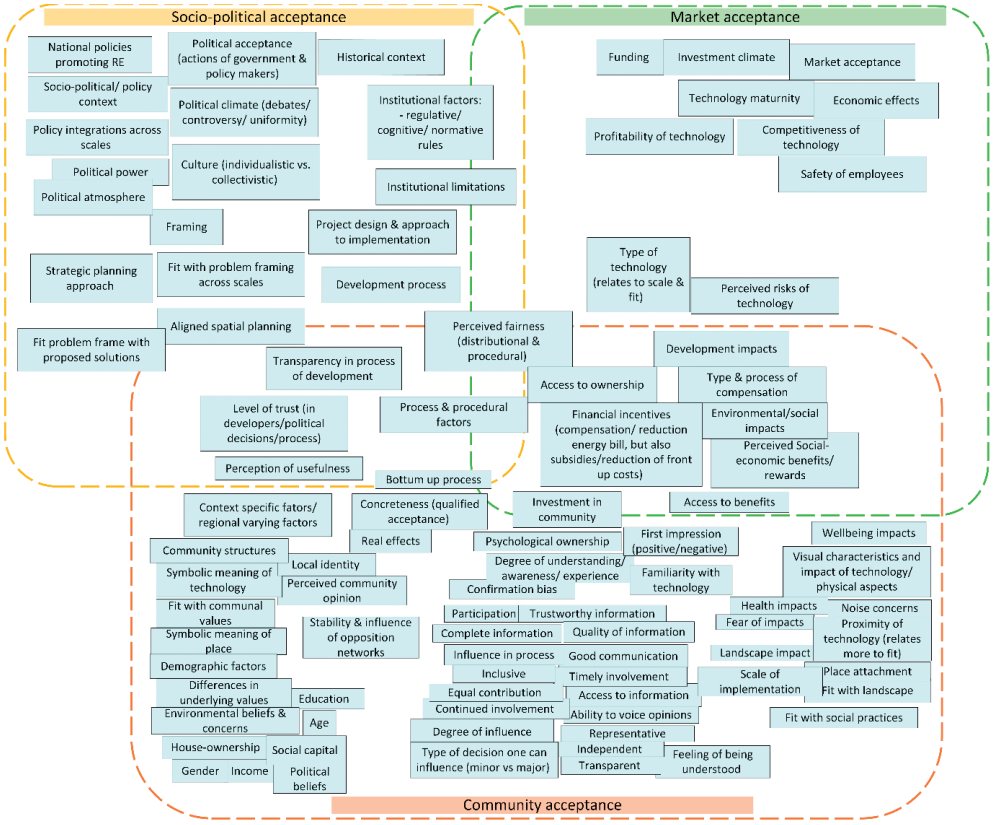


Figure 2.1. Factors hampering or stimulating acceptance-related responses of RET in a renewable energy transition context.

This model is based on literature review of the following articles: (Aas et al., 2014; Bevk & Golobič, 2020; Bidwell, 2013; Devine-Wright, 2007b, 2011, 2017; Huijts et al., 2012; Jones & Eiser, 2009; Kokkinos et al., 2018; Landeta-Manzano et al., 2018; Larson & Krannich, 2016; Leer Jørgensen et al., 2020; Liu et al., 2019; Mjahed Hammami et al., 2018; Perlaviciute et al., 2018; Petrova, 2013; Segreto et al., 2020; Soma & Haggett, 2015; Stenekes et al., 2016; Suškevičs et al., 2019; Sütterlin & Siegrist, 2017; Upreti & Van Der Horst, 2004; Whitmarsh et al., 2019; Wiersma & Devine-Wright, 2014)

B: Topic guide for semi-structured interviews Chapter 2

Opening questions
Context of the interview
Consent
Questions about the person: job, position in that job, etc. Living in the area.

Questions regarding decisions of RET project implementation
Can you tell a bit about how the RET project came about?
Can you give me some insights about the characteristics of this project?
When was the moment you heard this project was going to take place here?
What had to be decided from the moment you heard about the project?
What had been decided already when you heard about the project?

Questions regarding the feeling of acceptance over time and questions regarding what influenced their acceptance-related response
How would you describe your (initial) response and feeling towards the project?
Why did you have that initial reaction?
How was this response expressed/manifested?
In what way did this response change/stay the same over time?
Why was that the case? (important turning points?)

Questions regarding role + and how that changed over time
How would you describe your role in the RET project implementation process
How would you describe how you are involved in the project (tasks, decision power)
Why was that the case?
To what extent did this involvement and role change/stay the same throughout the whole project?
Why was that the case? (important turning points?)
Who else was involved in this process?
What was their role and in what way were they involved?
To what extent did their role and involvement change/stay the same throughout the process?
Why was that the case? (important turning points?)
How did you experience the process of this RET project development?

Closing questions
Anything else that comes up in your mind related to this RET project?
Upcoming projects/plans for the future?
Who else should I talk to?

C: Critical literature review Chapter 2

A critical literature review was performed to identify most significant publications in the field.

Search string (Title, abstract, keywords) in Scopus:

(“social” OR “Public” OR “Citizen” OR “End-user”) AND (“Accept* Or “Domesticat* OR “Attitudes” OR “Adopt*” OR “Approv*”) AND (“Reject*” OR “Repudiat*” OR “Oppos*” OR “Resist*” OR “Defianc*”) AND (“Participat*” OR “Engag*” OR “Involv*”) AND (“Sustainab*” OR “Renewable” OR “Green”) AND (“Project” OR “Projects” OR “Implement*” OR “Socio-technical experiment” OR “experiment” OR “Design”). Excluded disciplines: healthcare, mathematics, chemistry, neurology.

D: Topic guide for semi-structured interviews Chapters 3 & 4

Opening questions

Context of the interview.
Questions about work, position, living in the area.
Background questions about personal motivations for work, and workday practices.

Questions related to Project Aardgas Vrije Wijken (Gas-free transition)

Explanation of projects emergence and development.
Why this neighborhood
Specific characteristics of neighborhood; social groups
In what way are you involved; what is your role?
What is being expected? Why?
What did role involve exactly?
Why involved in that way?
General experience of involvement?
Why?

Questions related role over time

To what extend has this involvement remained the same or changed over the course of the project?
What were tipping points?
What did involvement entail over time? Expectations?
Why?
What is your opinion on that?

Questions related to others/collective

Who else was involved in the gas-free transition project?
In what way were others involved?
What was expected of them? What changed for people? Who is responsible for what? What is that based on?
How did others react to their involvement?
Why?
Over time:
To what extend did this involvement change or stay the same during the process? What was expected of people throughout the process?
What were tipping point of change?
Why?

Closing questions

Anything else that comes up.
People I should talk to?

E: Thematic analysis examples Chapter 3

Overarching themes related to citizens roles	Examples of theme categories	Examples of codes
Embedded	• Institutional factors ◦ Market related	Formal rules creating monopolist providers ACM not protecting consumer interests Providers not obliged to ask highest price
	• Lack of capabilities	Survival modus residents Social buyers problematic Financial constraints HA not having engagement Tenant being dependent
Dynamic	• Urgency considerations	Urgency for help Dilemma of long term steps
	• Changing over time	A living process of involvement Responsibility vacuum Colliding forces
Cross-actor	• Actors doings'/approaches	Participation dilemma Diverging participation strategies Residents suggesting research strategy
	• Relational	Distrust in government Taking role if others do too
Fluid	• Negotiation process	Social costs responsibility Weighing social costs Slow acting collective
	• Relation to the problem	Challenging capitalism with art Organizing livability events Engaged beyond energy problems

F: Full quote book of emerging logics Chapter 4

Logic	Description	Actor	Quote(s)
Neighborhood heat approaches			
Collective coordination logic	The need for coordination at the neighborhood level to achieve systemic efficiency and tackle multiple challenges simultaneously, such as technical infrastructure, social equity, and environmental goals. By acting collectively, residents and institutions can align investments, reduce redundancies, and ensure more inclusive and effective heat transition outcomes.	National authorities	By addressing homes on a neighborhood scale, rather than one by one, progress could be accelerated and costs reduced. Coordinating multiple projects and plans within a neighborhood, such as combining the installation of a heat network with sewer system replacement, should also lead to cost-efficiency. Moreover, the neighborhood is seen as the level at which various issues converge, such as poverty, poorly insulated homes, and unemployment, and can therefore be tackled in an integrated way.
Social or institutional responsibility logic	Carries the idea that individuals should carry the burden of finding and financing heat solutions on their own. Instead, it frames the heat transition as a shared social responsibility, where institutions, governments, and collective structures are expected to take the lead. This approach does not necessarily aim to integrate multiple challenges, but rather to ensure that individuals are not left to navigate complex transitions alone.	Some local authorities	Well look, if you have D66/VDD in a coalition, the more liberal side so to speak, they think freedom of choice is a really important ideal. Whereas is you have a more left-oriented or left wing coalition,[...] like GroenLinks/SP, yes then unburdening, helping, and not leaving anyone behind is way more central.
Individual autonomy logic	Solutions to the heat transition should emerge from residents themselves rather than being imposed or prescribed by authorities. It emphasizes personal freedom, asserting that effective and legitimate change stems from individual initiative and choice.	Some local authorities	You do not want to be the government that determines everything and say: you have to do it. Especially if it is going to involve your [residents] own money. What you want is that a group of local residents starts working together to find the best solutions for their own house.
Consumer control logic	Maintaining control over the choice of energy provider is important, including the ability to switch providers if prices rise. It reflects concerns about dependency on a single heat provider and the uncertainty around future pricing, highlighting the value of consumer autonomy and protection against potential price exploitation.	Residents (tenants and homeowners alike)	They do have a point.. that they do end up being tied to one party [heat provider] where we do not know what prices are going to do in the future.

Logic	Description	Actor	Quote(s)
Anti-monopolistic logic	Wanting to avoid dependency on a single energy provider, driven by concerns about monopolistic control and the risk of rising unregulated prices.	Residents (tenants and homeowners alike)	Idem Fieldnote Nijverheid: the resident that opened the door said not to want to talk about it [heat transition in neighborhood] much. The only thing she wanted to share was that she had the feeling that the heat network was pushed down the throat and she did not want that.. because with that you would only have one provider, so that would be a disadvantage because of the limited providers choice.
Evolutionary market logic	Trust that market-driven solutions will evolve over time to become more efficient and effective. It embraces interim or hybrid technologies as stepping stones that reduce emissions and energy use now, while anticipating that future innovations will provide final, sustainable solutions. The approach values maintaining the ability to adapt and incorporate improved or emerging solutions over time. It emphasizes avoiding lock-in to fixed or irreversible systems, ensuring that pathways remain open for adopting better, more efficient, or more sustainable technologies as they become available in the future.	Residents (tenants and homeowners alike)	And we also said: just start with hybrid systems. The municipality responded: "No, it's worthless, not a good solution, just a temporary fix. After that, you'll have to start all over again." They see the heat network as a final solution. We don't. With a hybrid solution, you still need a bit of gas, right? So you still need to find a final solution for that gas. But we believe those hybrid boilers last 15 to 20 years. In 20 years, the world will look completely different, with completely different developments. So yes, hybrid is a temporary solution, we agree with that, but in 15 or 20 years, we'll look at the knowledge and options available then. In the meantime, you've already reduced gas use by 70%. And if we had tackled this in 2018, we would've been done by 2020.

Logic	Description	Actor	Quote(s)
Affordability logic	The willingness to engage often exists but is constrained by the high costs involved and limited access to affordable financing. Even seemingly generous subsidies or support offers may fall short if the overall investment remains beyond reach, especially in low-income neighborhoods. Furthermore, structural barriers like credit checks and debt histories can prevent residents from obtaining necessary loans, reinforcing affordability as a critical condition for equitable participation.	Residents	So it's not that there's unwillingness, but rather: how on earth are we going to pay for this? Because, for example, the offer of €1,500 is a good offer, but for a lot of people, it's still a lot of money, especially here in Pendrecht. Well, the majority of residents are willing... But it shouldn't be too expensive. People, like I just said, expect a substantial contribution. "But if I get €15,000 in support and I have to invest €75,000... well, then it basically ends there for me." Yes, and what we were also talking about earlier this week, about those interest-free loans, for example... Poverty is already quite high here. And there are still no regulations regarding credit checks (BKR screening). So if people already have a negative mark with the BKR, whether it's even possible to combine that with an interest-free loan... I do not know.
Social costs responsibility logic	The government has a duty to consider and manage all costs related to the heat transition, including broader social costs that affect society as a whole. It emphasizes balancing collective welfare and public duty of care against individual preferences. The government's role is seen as ensuring fair distribution of burdens and benefits to achieve socially optimal outcomes.	Some local authorities	The line is so razor-thin between what is 'the best solution from a collective perspective', from the municipality's public duty of care, and what residents individually see as 'the best or cheapest solution for their own situation. Yes, it's an easy argument to say, "it's being forced down our throats." But no, it's about taking public responsibility to achieve the lowest societal costs. That's something entirely different from forcing something on people.
Private costs responsibility logic	Residents are responsible for individual or personal costs, so choices are based on taking this into account.	Residents	But anyway, it quickly became clear that the heat network was by far the most expensive option. So, we didn't think that was a good idea.

Logic	Description	Actor	Quote(s)
Participation in neighborhood heat transitions in vulnerable neighborhoods			
Protection or care logic	Reduce the risk of people being left behind by vulnerability mitigation and preventing residents from having to figure out everything on their own.	Some local authorities	And then you more or less get to the next question: what do you expect from people? That they participate. That they look at what they can do. But if four out of five of their problems are something other than energy and so on, then of course it makes sense, if the fridge is empty, if the kids can't read, if they're being beaten up by their partner, so to speak, then they have completely different issues. You can't expect anything from those people. You really need to unburden them, support them, and you should offer them something. An offer they can't refuse..[...]. A private homeowner is responsible for their own home. They basically have to arrange everything themselves. But the advantage of district heating networks is that, as a municipality, you can take a lot of that burden off their shoulders, because it's organized collectively.
Risk minimization logic	Participation is instrumental to increase trust between government and residents and create acceptance, thereby reducing costs of implementation.	Some local authorities	We started those kitchen table conversations to find out: is there support? What has already been done in the homes? What are you worried about? Can we address those concerns? And are you facing other issues, perhaps social problems, loneliness, or care needs? So we can take those into account as well. [...] You don't want to have invested €20,000 from the municipality into research for the heat network, only to end up with no public support for it. [...] What you want is for a small group of local residents to eventually start working together to figure out what the best solution is for their homes. And that's really why we choose to let residents experience it for themselves. Because the moment they realize for themselves, "this is the only solution," or "this is one of the few viable options," that's when you start to build support. So in terms of participation, our idea as a municipality was to take the lead, but not to come up with suggestions, alternatives, or solutions ourselves. Instead, we wanted to give residents the opportunity to decide for themselves what they want.

Logic	Description	Actor	Quote(s)
Prisoners dilemma logic	Choosing inaction or individual strategies because inability to anticipate others' decisions.	Residents (VVE's)	What's really strange with district heating is that almost everyone still has individual boilers, even in this area. You first have to make a decision, also for the individual boilers, that it will go through the homeowners' association (VVE), because you're doing drilling somewhere and that needs approval. And then everyone still has to individually decide whether they will join the district heating or not. So the members always have to make sure they simply say, 'we want something.' On the one hand, that's very positive, but on the other hand, it's also very vulnerable. Because if people don't show up, because they don't find it important enough for whatever reason, nothing will happen, or they save too little, or...
Bureaucratic logic	Internal institutional processes, such as interdepartmental coordination, established democratic procedures and differing bureaucratic practices and rules between stakeholders are frequently slow and run into unforeseen circumstances.	Local authorities and other stakeholders	But the downside is that everything takes a very long time, we're a pilot project, so it's quite difficult to get solid facts on the table. Well, you run into a hundred thousand things again, as we see [...] Social work is also often that you can't immediately deliver results. Yes, there's actually a request for that, but it's also something that requires a long-term effort. There are also community workers, and sometimes they don't stay in a neighborhood for very long [...] So it can be very, very complicated at times.

Logic	Description	Actor	Quote(s)
Decision uncertainty logic	State of hesitation and delayed action driven by unclear responsibilities and lack of decisive guidance from governing bodies. Residents and local groups feel unable to commit to a course of action because they await clear direction or policy from authorities, who themselves are reluctant to make firm decisions. The resulting communication gaps and institutional ambiguity foster a "wait-and-see" attitude, impeding timely progress in the heat transition.	Residents	And the homeowners' association (VVE) has to decide together with its members which direction to take. But they're very much in a wait-and-see mode, like: "Well, municipality, you tell us what we should do and what's possible." But the residents really wanted to know: "What are you going to do?" And we couldn't really give an answer, because the Council didn't want to make a decision on it, and neither did the bench of Mayor and Alderman. Yes, then at a certain point you run out of communication material. And what kept bothering us was that we couldn't attach a price tag to it. We couldn't say, "You'll be connected to the heat network, it's going to cost you this much, and that's cheaper than what you're paying now." That was the intention. But we just couldn't manage to get that done. So if you... you know, no one chooses something when you don't know... it's like buying a pair of pants and only being told the price afterward, that doesn't work. So that was very difficult. We'd do that differently now. We've learned from that, yes.
Political sensitivity logic	Political representatives, operating within a representative democracy framework, prioritize responsiveness to vocal and active constituents to maintain support and legitimacy. Fear of political backlash or losing voter backing makes decision-makers especially attentive to loud voices during public consultations, even if these voices represent only a small segment of the community.	Some local authorities	Meanwhile, the municipal council operates on direct democracy and listens accordingly. So when a proposal is put forward by the Bench of Mayor and Alderman for a decision by the council, they ask, "What does the neighborhood think about this?" So yeah, you know, that's your job as a representative, to gather that input, because that's why you're a council member. But yes, they often only listen to a few residents who are active and speak out loudly, just like I said earlier, someone who stirs up the mood in a meeting room by shouting loudly. That's who gets heard.
Representativeness logic	Vocal participation does not always represent the wider community, particularly in more vulnerable neighborhoods, where many residents remain disengaged or unheard due to multiple social challenges	Some local authorities	And it was also... well, part of the problem for us was that they [resident committee] kept saying they were speaking on behalf of the neighborhood, and we were thinking: yeah, but you're a group of men over 70, all white. You are not the neighborhood. And there's also a part of the neighborhood [...] with a different type of housing, a different type of tenant.

Logic	Description	Actor	Quote(s)
Transparency logic	Inviting residents to contribute their ideas and perspectives will foster transparency, trust and acceptance. By openly sharing information, even when plans are still in development, and encouraging dialogue, stakeholders create a sense of inclusion and ownership. The idea is that this facilitates more responsive and accepted outcomes.	Some local authorities	And then we immediately went to the neighborhood and organized an evening event. [...] And that actually turned out to be a really good evening, because we actually didn't know much yet, we could only share the basics and say: "So, what now? What should we be thinking about?" "Think along with us." "What comes to mind for you when it comes to going gas-free?" "What are your concerns, what are the opportunities?" [...] Whereas beforehand I was worried that people would show up expecting a fully detailed plan, but that wasn't the case. And we got a lot of valuable insights from the neighborhood that evening about how they were feeling about it. Then we also started making agreements with the residents' organization and with Welbions. Initially, the idea was that we would communicate jointly, with a single, shared sender, so to speak.
Agency logic	Being given space enables researching and thinking along for best solutions for the neighborhood.	Residents	And then the municipality had the idea: "Shouldn't you join the PAW project group meetings?" "Okay, and who's going to be there?" "Well, the director of the housing association in Hengelo, the director of the housing association in Enschede, a top executive from Enexis, development agencies, a provincial deputy..." "And... and then we're supposed to sit there like a couple of nobodies? What are we even supposed to do there?" But anyway, we decided to be brave and go for it, at least to gather information, so we'd know what they're planning. And well, it became clear that there are a number of options. And a decision needs to be made about what the best way is to make the Nijverheid neighborhood gas-free. That is something we're willing to contribute to, because we also want the best option for the neighborhood.

Logic	Description	Actor	Quote(s)
Incomplete knowledge logic	Residents have other responsibilities or interests which shape how they engage and include knowledge. This makes their understanding appear incomplete when expected to consider all aspects. As a result, the information residents gather, for example, about hydrogen or electric heat pumps, is often partial, biased, or unrealistic. What counts as 'reliable' or 'neutral' knowledge is different from the knowledge produced by residents themselves.	Some local authorities	So if the grid operator has to reinforce the electricity grids because everyone wants a heat pump that runs fully on electricity... then that leads to major grid expansion. And aside from the fact that it's technically not feasible to realize in the short term, it's also much more expensive. [...] That kind of cost isn't included in the invoice from the installer for your heat pump. And that makes it an unfair comparison. Whereas in the case of a heat network, for example, a network does need to be constructed, and the cost of laying the network is included in the invoice for connecting to the heat network. So it's not a fair comparison, and people feel that. People think: What's the cheapest option for me? And then it seems like this one is, because those costs aren't in the invoice. But they are, I'll call it "hidden", in the system. Those costs are still passed on to you through transport tariffs or socialized in your energy bill. You just feel that a lot less directly. If you look at it from that historical perspective, a heat network really is a very good solution. In fact, it was already the solution from the very beginning. That residents really wanted hydrogen has actually caused a two-year delay, partly because the national government was unclear in its communication with a clear core message that hydrogen is simply an illusion in the coming years, you could even call it a fantasy.
Strategic mobilization logic	Actively mobilizing information, neighborhood, relationships, and political support to ensure their knowledge, concerns, and preferences are heard, taken seriously and included in formal decision-making. Building alliances with political representatives, engage media or public forums, and use information flows to amplify their voice. This logic is about navigating and shaping the political landscape to defend their position and influence outcomes.	Residents	Once, we informed the entire Council, like, "If you [project group] are not going to do it, then we will." That was not appreciated.

Logic	Description	Actor	Quote(s)
Further privatization of energy access			
Historical fairness logic	Earlier energy infrastructures like natural gas networks were publicly funded as a collective investment, whereas current heat providers are expected to fully finance new infrastructure themselves without similar subsidies. It highlights the perceived unfairness between past public support and present self-funding expectations in energy transitions.	Heat providers	We now need to put a transmission grid there. After that we have to build a power plant there and a distribution grid to all those homes. Connection costs...? We are not subsidized, so somebody's going to have to pay us, right? [...] that is actually the warped fact about the current system... if you look at the 1970s, 1960s, natural gas was found in Slochteren, right? Who built the gas lines then?! That was all subsidized by the government!
Economic viability logic	Connection is offered contingent upon reaching a threshold of participants	Heat providers	For us it is important: is there enough further outlets in that area? Because we have to lay a transmission grid in that direction, and that is just not profitable for one customer [...] connecting low-rise buildings so to speak, that is mainly where the costs are [...] Plus the fact that those old houses often don't have the space [...] there lies also a big problem there, those context often have a unprofitable top that has to be taken off.
Burden-shifting logic	Rising costs and higher energy prices are increasingly being passed on to residents, putting the bill for the heat transitions on the poorest or low-income households and making them bear the financial weight of the heat transition.	Housing corporations and residents	If we pay for those costs, what do we pay that from... that is tenants' money! Every euro we put into closing their [heat providers'] business case, we cannot put into insulation, we cannot put into renovation,...I will name a few [...] and about that we say: that does not make sense, then you are putting the bill of the heat transition down to the poorest tenants in the city, and we are not going to do that.
Fairness and accountability logic	Current market rules, overseen by the ACM, are perceived as opaque and biased in favor of heat providers, leaving residents inadequately protected and unable to challenge unfair pricing or service conditions.	Residents	The ACM really needs to start protecting consumer interests. And not with some vague Excel sheet that gives heat companies so much leeway that the end user, the one who's supposed to pay for the energy transition, ends up bearing the cost. So the entire cost structure needs to be overhauled as well.
Anti-monopoly logic	Wanting to avoid dependency on a single energy provider, driven by concerns about monopolistic control and the risk of rising unregulated prices.	Residents	Fieldnote Nijverheid: the resident that opened the door said not wanting to talk about it [heat transition in neighborhood] much. The only thing she wanted to share was that she had the feeling that the heat network was pushed down the throat and she did not want that.. because with that you would only have one provider, so that would be a disadvantage because of the limited providers choice. But they [residents] do have a point.. that they do end up being tied to one party [heat provider] where we do not know what prices are going to do in the future.

Logic	Description	Actor	Quote(s)
Urgency in neighborhood heat transitions in vulnerable neighborhoods			
Survival priority logic	Residents facing poverty, chronic stress, or multiple social challenges often prioritize immediate needs, such as food security, housing stability, and mental health, over participation in long-term sustainability efforts like the heat transition. Limited mental space, emotional capacity, and daily survival concerns can prevent meaningful engagement. Rather than apathy or resistance, this reflects a survival mode shaped by structural inequalities.	Residents	But still, even if it were free, many people just don't have the mental space for it. They're just glad if they can afford to eat at the end of the week. Memo Nijverheid: She said she didn't really feel the need to talk about it, that she had other problems on her mind. [She remained very friendly.] She simply didn't have the mental space to engage in a conversation about this. She mentioned that in her street and neighborhood, many people were dealing with serious issues, and gave the impression that they are being overburdened. So that [being used to poverty] kind of becomes the norm, it turns into a habit, just to survive in it. You go into a sort of survival mode, like, "Oh right, I have to do it this way and that way."
Long-term rational planning logic	Heat networks and other infrastructural solutions are seen as inherently beneficial when evaluated through long-term, technical, or financial calculations. It emphasizes system-wide efficiency, economies of scale, and cost-spreading over time, often justifying current investments or discomforts by pointing to future payoffs.	Governments, including local authorities, housing corporation and intermediaries.	So it's already heavily subsidized [heat network], and look, if you spread it out over 10 years, €1,500 without interest, you're talking about ten euros a month, right?
Political logic	A focus on visible and short-term results driven by electoral cycles and political accountability pressures.	Political actors within local authorities	The term for Alderman is four years and sometimes it's two or three times four years. But after four years, they either have to have achieved something, get re-elected, or step down. That doesn't make them suspicious in the sense of doing anything wrong, but it's entirely understandable that if you keep working the way you do, it's not exactly conducive to achieving long-term results.
Integrative logic	Integrating multiple solutions for multiple neighborhood problems at once, thereby working across disciplines.	Local authorities	Idem

Logic	Description	Actor	Quote(s)
Compliance logic	Having to meet regulatory targets within set timelines, such as achieving heat transition goals by 2050, by focusing on scalable, efficient, and technically straightforward interventions. It prioritizes doing "just enough" to comply, such as replacing heating systems without necessarily integrating broader improvements, in order to meet numerical goals within resource constraints.	Housing corporations	The big difference from how we used to do things is that we always combined it with a full renovation. And you can see that when we do that, we manage about 800 homes per year. Well, we have 50,000 homes, and 20% has been done, so we still need to do 40,000. That means we'd need to do around 1,400 to 1,500 homes per year if we want to stay on track for 2050. That's almost double. So it's not realistic to always link the heat transition to a full renovation. In these area-based approaches, we now really need to focus much more on just the heat transition itself, basically, to put it very simply: remove the boiler, bring in the new pipework, install the delivery set, and figure out how to still make a decent offer to the resident in that context.
Synergy logic	Aligning the heat transition with broader renovation goals, combining sustainability efforts with improvements to housing quality and resident well-being. It favors integrated, high-impact interventions that address multiple issues at once, such as full renovations, even if they are slower or less scalable. The approach seeks added value for both the housing stock and its residents. So, aligning energy renovations with necessary maintenance work for improving overall living conditions.	Housing corporations	Idem
Market or investment logic	The business case for heat networks is more attractive with already- insulated homes.	Heat providers	So for us, for example, the areas that are currently interesting are mainly in Heerlen city center, and we're also looking in Hoensbroek, by the way, at where renovations are going to take place or where demolition and new construction will happen.

Logic	Description	Actor	Quote(s)
Funding allocation in neighborhood heat transitions in vulnerable neighborhoods			
Equality logic	Emphasizes uniform treatment, ensuring that everyone is offered the same deal or opportunity, such as a the €1,500 connection fee for all homeowners. It values simplicity, clarity, and consistency in policy, aiming to avoid perceptions of unfair preferential treatment. Everybody pays the same, so is treated the same.	National- and local authorities	That is... fortunately, let's say, there's a sort of policy in place with amounts that can be guaranteed for a long time. It's already been quite a while that you can get connected for €1,500.
Equity logic	Prioritizes fairness by taking into account people's differing capacities and needs. It questions whether uniform policies actually lead to just outcomes, especially when more affluent or resourceful individuals benefit from subsidies or support they don't strictly need. Instead, it advocates for differentiated contributions, where those who can afford more pay more, enabling greater support for those with fewer resources.	Intermediaries	Of course, this is what makes the issue so difficult, or at least what often gives me a stomach-ache: that €1,500 and the intent letter had to be signed. Well, that was signed without hesitation by many people who could easily have paid more, who understood the whole picture and were perfectly capable of arranging things themselves. And these are often the same people receiving subsidies, you know, the ones whose homes are already well insulated and who really have everything under control. So yes, it remains really tough. Sometimes I think: couldn't we have just asked you to pay €3,000, so that someone else could get it for free?
Costs-benefit logic	Will my investment pay of? This logic centers on whether an investment in the heat transition will lead to tangible personal savings or benefits. For residents who already minimize energy use, such as by not heating their homes due to financial constraints, the perceived return on investment is low or even negative. Taking on debt to finance upgrades may increase their monthly costs, making the transition seem economically irrational. In contrast, for those with high current energy expenses, the potential for savings makes the investment more appealing and justifiable.	Residents	I personally called a few people in Pendrecht. It just so happened they all lived in an older housing complex, and the first three basically turned me down over the phone. And the others said the same, number three, for example, said, "I don't heat my home," and added, "I'm spending less than fifty euros a month on everything." If I'm already not heating my home now because I can't afford it, my energy costs are low, and then I'll be given a loan because I have to invest, so my costs will go up regardless. There are people who spend €300 a month on heating... that's easier, because if you tell them they'll only have to pay €200 a month in the future, that's a win."

Logic	Description	Actor	Quote(s)
Capability logic	Can I pay at all? This logic is grounded in the basic question of affordability, whether individuals or households have the financial means to participate in the heat transition at all. It does not reflect a lack of willingness or motivation, but rather a fundamental concern: "How can we possibly afford this?" This logic highlights that even supportive residents may be excluded from transition efforts if financial capacity is not taken into account.	Residents	So it's not that there's unwillingness, but rather: how on earth are we going to pay for this? Yes, and what we were also talking about it earlier this week, about those interest-free loans, for example... Poverty is already quite high here. And there are still no regulations regarding credit checks (BKR screening). So if people already have a negative mark with the BKR, whether it's even possible to combine that with an interest-free loan...I do not know.
Capacity building logic	The need for developing the organizational, procedural, and human infrastructure required to effectively manage and implement neighborhood heat transitions. It highlights that successful transitions are not just about technical solutions or funding, but about building internal capabilities, such as strong project teams, local knowledge, and community engagement processes.	Local authorities	Well, we received a subsidy for that. We brought in an external party to ultimately handle it within De Lemmender, that's where the PAW program plays a role. And it didn't go the way we had hoped [...] a new project team has started and realized that not much has happened by that external party [...] so we're really starting to work on it much more actively. We also have two neighborhoods per year that we have to start with, at the very least, we need to get a clear picture of: what is the condition of the homes in this neighborhood? How do the residents feel about it? What is possible? So there's a lot of work to be done. Last year there was an article in de Volkskrant titled something like, "Oh yes, all those municipalities hiring all those consultancy firms," and I thought to myself, yeah, that's true, and I totally agree, please don't hire us. But it's also because... it's not just about time, as is often said, it's also simply about a lack of courage or something like that. It's not easy to stand up and change things within a system like this.
Redistribution logic	Centers on the question and need to allocate financial resources in ways that provide direct, tangible social benefits to residents, especially those most affected by the heat transition. Questions the balance between investments focus solely on capacity building and direct social benefits investments.	Intermediaries	I recently attended one of those neighborhood meetings organized by a housing corporation. And you really notice that there's a lot of resistance from residents. Like, "Sure, great that you're putting in a heat pump, but what's in it for me? Will it save me money?" [...] "If I have to go gas-free, I want it to be cheaper. Can you guarantee that?"...No, we can't guarantee that...."And my house is drafty, can something be done about that?" No, because the money's run out.

Biography

Nikki Kluskens (Maastricht, 1996) obtained her Bachelor of Laws (2017) at Radboud University and her MSc in Sustainability Science and Policy (2019) at Maastricht University. Her master thesis entitled "Energy justice as part of the acceptance of wind energy: an analysis of Limburg in the Netherlands", was published shortly after graduation.

In 2020 she began her PhD at the Technology, Innovation and Society Group at Eindhoven University of Technology, specializing in citizen engagement in energy transitions. Her research examines how citizens participate in and shape energy transitions, emphasizing the relational, embedded, and processual dimensions of engagement. Challenging dominant framings that position engagement as either a tool for acceptance or a normative ideal for empowerment, her work explores how citizens' roles, agency, and perspectives are co-constructed across institutional, socio-technical, and relational contexts. During her PhD she was a visiting scholar at Durham University. Her empirical work spans heat, wind, and solar energy initiatives in the Netherlands, with a focus on community acceptance, energy citizenship, and engagement in marginalized neighborhoods.

Nikki has published her work in peer-reviewed journals and presented at multiple scientific conferences. She has developed and applied creative and inclusive research methods, including the co-development of a theatre-based method that makes underlying assumptions in participation processes visible. In addition, she co-developed the Energy Futures Prep Pack, a method designed to foster meaningful dialogue about sustainable energy futures, which was showcased at Dutch Design Week 2024.

Beyond research, Nikki holds a partial University Teaching Qualification (UTQ/BKO) in teaching and supervision, and has experience in big research consortia, notably with the Flexinet project, a multi-stakeholder research consortium exploring flexible energy systems through citizen involvement and co-creation. She is actively engaged in valorization and impact-driven activities, including designing and facilitating stakeholder workshops on participation and acceptance in energy projects.

Publications

Part of this PhD thesis

Kluskens, N., Alkemade, F., & Höffken, J. (2024). Beyond a checklist for acceptance: understanding the dynamic process of community acceptance. *Sustainability Science*, 19(3), 831-846.

Kluskens, N.T.T.M., Höffken, J. I., & Alkemade, F. (2025). Exploring opportunities and limits of energy citizenship in Dutch heat transitions. *Energy Research & Social Science*, 127, 104184.

Kluskens, N. T.T.M., & Höffken, J. I. (2026). From tension to transformation in Dutch heat transitions: Leveraging time, transparency, and relationships. *Energy Research & Social Science*, 134, 104626.

Other

Kluskens, N., Vasseur, V., & Benning, R. (2019). Energy justice as part of the acceptance of wind energy: an analysis of Limburg in the Netherlands. *Energies*, *12*(22), 4382.

Wieczorek, A. J., van Bommel, N., El-Feiaz, A., Kluskens, N., Niet, I., van Summeren, L., Höffken, J.I., Alkemade, F., Van den Berghe, L.., Meloni, C., Graditi, G., & Di Somma, M. (2024). Energy Communities as an Alternative Way of Organizing the Energy System in Europe: Key Societal Aspects. In *Integrated Local Energy Communities: From Concepts and Enabling Conditions to Optimal Planning and Operation*, 353-388. Wiley-VCH.

Kluskens, N.T.T.M., Niet, I.A., Van Bommel, N., Van Summeren, L.F.M. (2025). Flexible and Just: ICT in flexibility energy communities- *under review*

Media

Opinie Energiearmoede: “De Winnaars van de energietransitie zijn de welgestelde burgers”, Nikki Kluskens & Kees van der Wel, published in *NRC*

Interview with Vroege Vogels BNN/VARA (18-10-2024) “Met design de wereld verbeteren”

Interview with Cursor (23-10-2024) “Toekomstige energiescenario’s verkennen tijdens DDW”