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Master's in Environmental and Energy Management (MEEM)

Narratives for Change:

The underlying narratives of Aardehuis in establishing a community microgrid.

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Master Thesis

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Acknowledgements

Abstract

This thesis explores the narratives, which are cognitive understandings of complex systems, found within the stakeholders of the eco-community Aardehuis, located in the village of Olst, in the Netherlands. This exploration has the main objective of understanding how an established niche's narratives can be used to draw insights for establishing a new niche technology within. The new technology in question being a community microgrid: a collection of energy-related technologies (batteries, generators, transformers, etc.) made to decentralize the energy generation and consumption of a community from the national grid. More details are presented regarding what microgrids are, why Aardehuis is a promising contender, and how narratives play a significant role in promoting action. The study of the community is conducted through a novel framework proposed for analyzing a niche's capability of on-boarding new innovations: the strategic niche-narrative analysis (SNNA). Based on, as the name suggests, aspects of both strategic niche management, and narrative analysis. The investigation draws its data from semi-instructed interviews of ten Aardehuis stakeholders. Having the goal of uncovering how de Aardehuis' stakeholders engage with the community, the structures in place (rules, cultural norms, and resources), and the insights that their experiences provide, both general and towards decentralization. The findings of this research detail a community that is in a unique position to take advantage of pre-existing infrastructure in their ongoing partnerships with the municipality of Olst and the SERENE project. In addition, the narrative synthesized from SNNA recommends focusing on the improvement of current networks, taking advantage of resident's support for more self-sufficiency, and dedicating time to address de Aardehuis' decision-making process. Overall, this investigation brings a new perspective to the energy transition field, as it attempts to operationalize methods of bridging technology and individual perspectives into recommendations for technological adoption.

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1. Introduction

1.1.   Climate change, the energy transition, and energy solutions

As the world reaches the critical benchmarking years of 2030 and 2050 for greenhouse gas emissions, attention has been drawn to the difficulty in overcoming the "carbon lock-in" phenomenon that keeps us in an unsustainable trajectory (Seyfang & Haxeltine, 2012). Claims that radical transitions are needed stem from these contemporary difficulties, in addition to climate change extinction forecasts, and the consequences of reaching "peak oil" in a fossil-fuel-centered landscape/infrastructure (Thomas et al., 2004; Rech & Duterne, 2021). The proliferation of technologies such as photovoltaics, wind turbines, hydroelectric dams and nuclear power have sculpted the technical side of the unfolding *energy transition*. These technologies bring with them a fundamental and ideological rethinking of how our societies should interact with, and implement, one of the world's most coveted commodities (Seyfang & Smith, 2007). This rethinking, in part, can be attributed to three emerging trends in contemporary energy technologies: "decentralize, decarbonize, democratize" (Green, 2016; Hirsch et al., 2018). This emerging trend heralds a fundamental re-shaping of current, increasingly complex, energy grid systems. Within the energy transition, one energy solution appears well-suited for the job: microgrids.

Microgrids are a collection of energy technologies that, unlike a national grid system, service small-case projects. These services entail generation, storage, and transmission of electricity, and can safely connect and disconnect from a major grid system. The focus on microgrids, and more specifically community microgrids, comes from their potential in addressing the consequences of new energy technologies, our contemporary transitive period, and shifting economic principles. The rise of renewable energy has brought with it a newfound demand for energy storage systems (batteries, fuel cells, etc.) to address intermittent generation. Microgrids, as argued by Ansari et al. (2016), play a significant role in connecting renewable energies and energy storage systems, acting as the technical backdrop that physically connects and manages them. Furthermore, attention is drawn to the interactions between society and technology throughout the energy transition literature (Rip & Kemp, 1998; Hermwille, 2016). Meaning that implementing community microgrids can stem from both economic and ideological reasons (Hirsch et al., 2018), but overall take advantage of current trends in energy solutions (Uddin et al., 2023). Lastly, these microgrids, according to Seetharam et al. (2020) bring together consumers and prosumers of energy in a cooperative fashion by allowing the sharing of excess generation with national grids. This, in turn, synergizes with contemporary re-thinkings of sustainable societies. All this potential, however, has so far been primarily realized in controlled environments that incentivize and tolerate disruptive innovations.

As a new tool, microgrids rely on favorable conditions, and active engagement from stakeholders, to exist (Uddin et al., 2023). These conditions come in the form of facilitated administrative procedures/financing, and conscientious involvement of public (local and regional) institutions focused on promoting microgrid projects (Hernández et al., 2023). Said conditions align themselves optimally when disruptions to the status quo present themselves, such as when the European Union (EU) predicts a 10 to 20% drop in total oil supplies over the 2030s (Rech & Duterne, 2021). Within the continent of Europe, several microgrid efforts have been explored in the form of the EU Microgrid Research Project (1998-2002) and the EU More Microgrid Research

Project (2002-2006) (Hatziargyriou et al., 2007). These projects sought to initiate pilots across Europe, and ever since, their development has been sporadic. A PhD researcher from the University of Groningen, the Netherlands, is actively mapping out microgrids within the continent: with 21 existing microgrids, 6 potential ones that lack information, 2 under construction, and 1 failed (Behrendt, 2022). Given the sparse number of existing microgrids across the entire continent, the complex legality of decentralized energy generation within the EU (Behrendt, 2023), and the aforementioned conditions, this research handles the potential energy solution as a "niche."

This categorization allows the study of community microgrid propagation to be approached with additional emphasis on the participation of stakeholders, their alignment of expectations, and the lessons learned for future projects. Combining this with the notion that "there is no simple cause or driver in transition. Instead, there is co-evolution within and between levels, i.e., processes at multiple dimensions and levels simultaneously" (Geels & Schot, 2010, pg 27), then it becomes clear that consideration must be given to the normative/intrinsic values that come into play to establish a community microgrids. To this end, Hernández et al. (2023) argues that "the success of an installation of this type depends on the social and cultural aspects of the individuals who make up the community in which the MG [Microgrid] will be installed" (Hernández et al., 2023, pg 8). Kemp et al. (2001) argues that a key characteristic of niches is that they foster support from their participants. Thus, a good place to start the research into new microgrid projects within the Netherlands is to investigate a community that owes its existence to a strong social and cultural cohesion. De Aardehuis, an eco-community located in Olst, the Netherlands, operates under the motto "Building, working and living in harmony with nature, in connection with each other and to inspire the world". Completing its construction in 2015, the community boasts 23 homes with 75 residents (Aardehuis, n.d.). Most recently, the community has entered a partnership with the Sustainable and Integrated Energy Systems in Local Communities (SERENE) project and is expanding its electrical infrastructure (SERENE, nd.). Therefore, investigating de Aardehuis' narratives allows for a study into stakeholders' experiences (Rehmann-Sutter et al., 2006) and with the right framework, provide a glimpse into the ability to develop a microgrid.

This research seeks to explore what elements are necessary to study the development of a community microgrid through synthesizing that same community's narratives. Treating narratives as, in its most basic terms, the internalization of complexities found within a community (Marschütz et al., 2020). A potential synthesis, calibrated by processes used to implement niches, and turned to the potential development of a community microgrid, can show new ways to foster support for niches such as microgrids. To tackle this proposition academically, a narrative analysis is used in collaboration with strategic niche management to establish the "strategic niche-narrative analysis" framework. This framework is made up of three core elements: stakeholders, structures, and stories. Stakeholders explore which actors are present, and how they engage with the project. Structures speak to the rules, cultural norms and resources at play. Finally, stories reflect crucial experiences, insights to decentralization, and connections to larger narratives within academia. Yet, despite all that microgrids can bring to the energy transition, the false notion of an all-encompassing solution, or "panacea", must be debunked. Microgrids represent one of the many tools to fight the heavy industrialization and consumption patterns that exceed what our planet is capable of providing (Rockström et al., 2009). It is, by no means, the only solution.

1.2. Scope of research

To prove the utility of narratives within niches, and to create such a narrative, this research sets out to understand the process of the eco-community Aardehuis. How the stakeholders came together, what systems helped their development, and what experiences and insights they have to offer. De Aardehuis is therefore investigated in hopes of extracting these relevant datapoints that pertain to the elements at play in the strategic niche-narrative analysis framework. Focusing on a singular community allows for a robust investigation of its residents and relevant stakeholders, as well as establishing a controlled environment. Meanwhile, the choice to study a community within the Netherlands stems from both obvious practical and not-so obvious technical reasons. Practically speaking, the University of Twente's master's in environmental and energy management is in the Netherlands. Technically, the Netherlands is going through a consistent surge in renewable energy development (Netherlands, 2024) that, as alluded to in Section 1.1, requires the adoption of innovative ways of organizing these new renewable energies. De Aardehuis already benefits from some renewable energy generation (de Graaf, 2018) and has recently expanded upon its battery infrastructure and generation capabilities (SERENE, n.d.). Building a community microgrids from this foundation offers a unique form of potentializing Aardehuis' energy transition. However, this requires significant individual and collective organization, change, and dedication to become a reality (Hernández et al., 2023).

Exploring how this niche community was realized, and is maintained, is already possible through the three strategic niche management processes of visioning, networking, and learning. The study of these processes allows for the identification of crucial factors in the Aardehuis' previous success and can be analyzed from the perspective of proposing and developing a microgrid within the same community. To contextualize the findings of these processes, and as a "means to build a bridge between the micro-structure of the individual and the macro-structure of collective, social knowledge" (Hermwille, 2016, pg 239), the narrative analysis is employed. By synthesizing a narrative from an existing community, the knowledge within can prove helpful in ascertaining the acceptance of implementing a microgrid in Aardehuis and provides a new perspective in understanding what de Aardehuis entails, how they succeeded before, and can expand upon what is already there. Within the field of academia, how the resulting narratives relate to those in climate change action is conducted with the help of a literature review into the latter, with links drawn between renewable energy trends and the narrative unearthed within this community.

1.3. The research question and its building blocks

This thesis answers the following research question:

"How can underlying narratives be leveraged to propose and develop a microgrid in the community of Aardehuis?"

With the following sub-questions also explored:

i)   "How do insider and outsider stakeholders engage with de Aardehuis?"
ii)   "What structures currently exist that work in favor, and against, the community?"
iii)   "What actionable information can be drawn from stories of the development and maintenance of de Aardehuis?"

2. Literature Review

This research's literature review embarks on an exploration of what microgrids are, and how they relate to challenges brought-on by the energy transition, and what entails a community microgrid, in addition with the advantages and disadvantages of certain technical elements presented within them. This is then proceeded by de Aardehuis' current energy systems, and how that set-up synergizes with the development of a microgrid. Lastly, an overview of the relevance of studying the narratives employed to tackle climate change is presented to introduce elements used for developing the framework of this research.

2.1. Community microgrids as an energy solution

A microgrid can most succinctly be described as "a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island mode" (Ton & Smith, 2012, pg 84). A collection of energy technologies, depicted in Figure 1. Conceptual overview of community microgrids, courtesy of communitymicrogrid.net., that can provide services to un-electrified communities (Hernández et al., 2023), alleviate pressure from centralized transmission and distribution systems (Hirsch et al., 2018), and the capability of creating communities of prosumers that experience significant energy cost savings (Razanousky et al., 2010). The "technology agnostic" (Hirsch et al., 2018, pg 404) nature of microgrids means they tend develop in small, stakeholder-designed niches of the larger generation, transmission, and distribution infrastructure. A natural consequence of their ambiguous description is the fact that microgrids have seen a wide range of applications best summarized by Uddin et al. (2023) as 1) *institutional and campus*, 2) *commercial and industrial*, 3) *community and utility*, and 4) *island or remote*. This research focuses on c*ommunity* microgrids, which range from urban settings to rural environments, can involve singular or multiple owners, and must adhere to engineering standards to a larger electrical infrastructure while retaining the ability to completely disconnect (Hirsch et al., 2018). The focus on community microgrids also relates back to the three trends found in contemporary energy solutions. By engaging in a community microgrids, all stakeholders gain significantly more influence over which forms of energy generation are employed within their own communities (democratization), they obtain a new way of interconnecting their renewable energies (decarbonization), while also presenting a bridge between decentralized infrastructure and the current landscape.
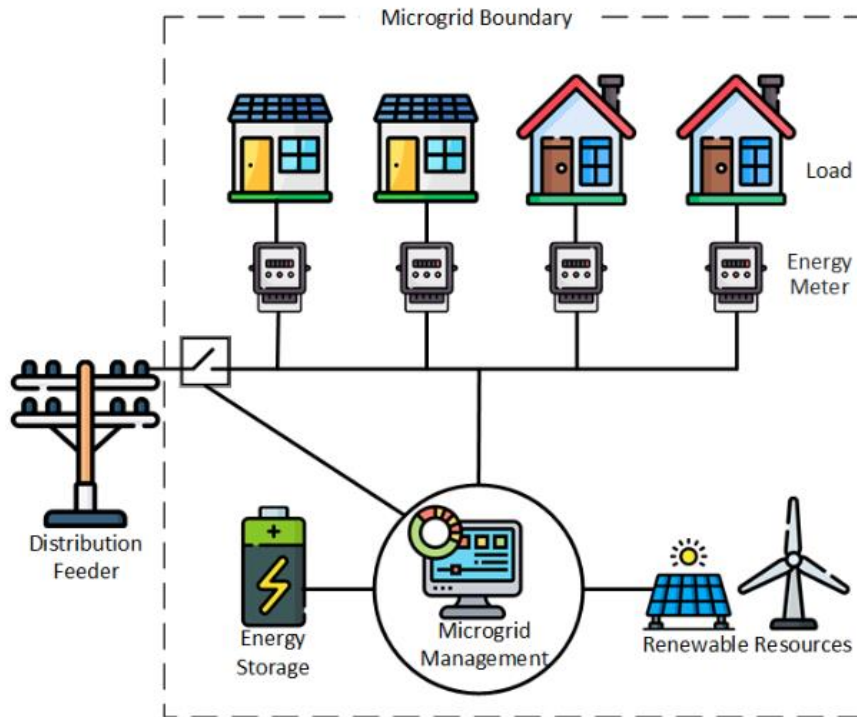
Figure 1. Conceptual overview of community microgrids, courtesy of communitymicrogrid.net.

Community microgrids belong to a wider concept of energy communities that are often discussed in tandem with democratization, decarbonization and decentralization: integrated community energy systems (ICES) (Koirala et al., 2016). Therefore, literature regarding ICES provides a generalized glimpse into microgrid's comparative performance. Koirala et al. (2016) compiles ICES as the existing energy infrastructure and available resources that a community leverages to find solutions for energy involving *local generation, local balancing, collective purchase,* and *environmentally friendly practices* (such as integrating renewable DER). Community microgrids distinguish themselves from ICES by being capable of "island mode and grid interoperability technologies" (Warneryd & Karltorp, 2022, pg 1) with a singular point-of-contact regarding electrical and market forces (Koirala et al., 2016). A comparative analysis between community microgrids and other ICES concludes that community microgrids perform on-par with other ICES in terms of degree of integration and value generation. Underperforming mostly in regard to *community engagement* (Koirala et al., 2016). Yet, microgrids provide high degrees of integration and value generation akin to other ICES, potentially facilitated by the individual components that the community may employ. A breakdown of each component's advantages and disadvantages in microgrids can be found in Table 1.

Microgrid Components	Advantages	Disadvantages
Photovoltaic/Solar (Planas et al., 2015)	Low maintenance cost, diverse applications, reduced carbon footprint, frequently subsidized, "plug-and-play" for Direct Current (DC) applications.	Reliance on the sun, if not subsidized: high investment, requires energy storage solutions and inverters for Alternate Current (AC) applications.
Wind (Planas et al., 2015)	Location independent, reduced carbon footprint, and low production cost.	Reliance on wind intensity, susceptible to Not in My Backyard (NIMBY) social opposition, and significant noise pollution.
Hydrogen Fuel Cells (Kirubakaran et al., 2009)	Low emissions, low noise pollution, and the possibility of combining heat and power.	Fairly new technology, expensive hydrolysis process, volatile/expensive infrastructure requirements for storage.
Battery Storage (Planas et al., 2015)	Rate optimization, mitigation of intermittency, versatile, and a low carbon footprint.	Size constraints directly linked to possible capacitance, limited battery life, and a high investment cost.
Micro Combined Heat & Power (CHP) System (Murugan & Horák, 2016)	Wide electrical range (1-500 kW) and relevant to most domestic appliances. Synergizes with Hydrogen Fuel Cells.	Carbon footprint relies entirely on the primary mover of the CHP. High investment cost.

Table 1. Advantages and disadvantages of potential microgrid components.

Community microgrids differ from other microgrids in more ways than their technical applications; bringing to the table a focus on bottom-up organization, previously observed in their stakeholder-catered nature, and an intrinsic, normative value in their implementation. Within the Netherlands, Dóci et al. (2015) explored how renewable energy communities do not seek to entirely replace centralized energy *regimes* but instead focus on affecting transition by bringing attention to alternate ways of incorporating renewable energies. It should be noted that this research stands apart from Dóci et al. (2015) by focusing on ICES's subsect of microgrids that prioritize decentralization as much as decarbonization and democratization. In addition to the motivation behind these communities, Warneryd & Karltorp (2022) argues that *informal institutions*, those being "attitudes, norms and values as well as visions and expectations among actors", prove important in the retention of these forms of bottom-up initiatives (Warneryd & Karltorp, 2022, pg 3) Their research, alongside a vast wealth of literature, helps further categorize microgrids as a solution that sits within the *niche* level of a *landscape* shaken by the vast influx of

renewable energy (Dóci et al., 2015; Warneryd & Karltorp, 2022; Hirsch et al., 2018; Ajaz & Bernell, 2021).

2.1.1. De Aardehuis in context of microgrids

De Aardehuis eco-community finds its technical systems in the unique crossroads between self-sufficiency and cost-effectiveness. In 2018, the community generated 107,9 MWh, consumed 32,2% of that and fed the rest back into the main grid. To achieve these numbers, the community boasted 275 solar panels, 22 wood stoves and 22 individual connections to the grid (de Graaf, 2018). In addition, the levelized cost of energy for Aardehuis conveys an economically sensible story. Levelized cost of energy is simply the sum of all costs of production for a unit of generation, divided by the sum of electrical energy produced over its lifetime (Ajaz & Bernell, 2021). De Graaf identifies that Aardehuis' current levelized costs are on average 0.21 €/kWh (with the reference of "traditional" costs being 0.29 €/kWh) (de Graaf, 2018). Therefore, regarding technical and economic performance, de Aardehuis can be considered a successful pilot for self-sufficiency in communities. Furthermore, in recent years, they have expanded upon this notion with several partnerships. As of 2020, the community expanded upon its photovoltaic (PV) and battery systems to provide an additional 120kWh of capacity in partnership with the Sustainable and Integrated Energy Systems in Local Communities (SERENE) project (SERENE, nd.). With this expansion, de Aardehuis appears open to the idea of improving upon their current infrastructure and even undertaking larger projects a decade after its construction.

The "low-tech" approach adopted early-on by Aardehuis (Aardehuis, n.d.) does mean that any new investments into energy will come at significant capital expense as new technologies are required. Within the same report of Aardehuis' energy infrastructure, de Graaf (2018) provides two alternative scenarios to develop the community's energy self-sufficiency. Advocating for the implementation of ICES, de Graaf outlines two scenarios: A Smarter Grid and Grassroots Redesign. Both scenarios cut down the 22 grid connections to 1 and achieve higher rates of self-consumption (45,1% for Smarter Grids, 89,3% for Grassroots Redesign). The latter's drastic increase of self-consumption is mainly attributed to the use of a Micro Combined Heat & Power (CHP) running on wood chips (see Table 1). A Micro CHP system is a cogeneration system that uses fuel to produce both energy and heat (Murugan & Horák, 2016). On the other hand, the Smarter Grid's main upside is the use of existing technologies (namely PV panels) and the application of smart metering. The specific elements that could constitute an Aardehuis microgrid fall outside the scope of this research, as de Graaf's investigation provides an opening that is expanded herein through the addition of narratives and how they can affect change within the community.

2.2. Narratives and climate change action

Narratives, for the purposes of this research, are employed as the social science concept that interprets how people –particularly those engaged with de Aardehuis– "cognitively make sense of

their complex experience of the neighborhood where they live and invest in its values and meaning" (Marschütz et al., 2020, pg. 3). Narratives bring a focus to interconnectedness, strategic characteristics, and affective behaviors present. A clarification regarding what is, and is not, a narrative is then required. Specifically, a clear distinction between narratives, stories, and storytelling due to how interchangeable these terms, colloquially speaking, can be. Moezzi et al. (2017) and Dobroć et al. (2023) argue that stories often embark on an exploration of thematic concepts that develop around a protagonist which acts as the driving force behind change. Storytelling is interpreted as a means of sharing or transferring narratives that mirror one's worldview, with the possibility of influencing how communities perceive their own actions (Moezzi et al., 2017). In contrast, narratives present thematic elements such as actors, places, and artefacts but with a greater focus on the mechanisms, *how* these elements are interconnected and included (Dobroć et al., 2023). The inclusivity does not help establish concrete instructions but instead assesses stakeholder involvement within a project.

This research then runs into the fact that narratives can often manifest as 'narrative ethics', a combination of both "experience with reflected action and identify formation" (Meisch, 2019, pg. 2), and strategic narratives. Narratives refer to people's experiences (Rehmann-Sutter et al., 2006; Düwell, 2014), an inherently reflexive act, and engages with a social groups' actions (Meisch, 2019). This presents a challenge of subjectivity to the research. In an attempt to operationalize narratives, Marschütz et al. (2020) ascribes them to experiences tied to a specific time and place, exchanged to promote effects, morals, or emotions. Strategic narratives, on the other hand, build upon Marschütz's characteristics by adding social context and moral conflicts (Bushell et al., 2017); defining them as narratives meant to persuade and influencing a particular outcome. Great focus is given to the need for these narratives to come from "people whom the intended audiences trust and respect" (Bushell et al., 2017, pg. 47). Meaning that, to study de Aardehuis' narratives, this research requires input from the community's own residents and stakeholders. Of which, many have been present since its inception and have formed a strong identity surrounding it. Having stakeholders of the community be the driving force behind the narrative assembled in this investigation affords a degree of legitimacy that contextualizes the biases and insights found within.

This affective and biased aspect of narratives, however, is found within the wider context of climate change and has been argued to help understand how individuals engage with it. Roelvink & Zolkos (2011) argue that political and ecological action is not the product of the human subject, but instead of affection that is often lost due to the temporal dissonance regarding the impact of climate change. Climate change, in its most abstract form, is also perceived as a 'geo-traumatic' event that carries with it "complex and affective baggage" (Verlie, 2019, pg. 5), meaning that climate change action is also tied to individual affection and emotional response to their environment. The manifestation of these affective elements is of value to this research, as they give "testimony to transformations which do not start with human rationality or calculation" (Roelvink & Zolkos, 2011, pg. 44). Meaning that narratives can be used to understand the emotional or ideological basis for individuals that engage with climate change action. With Bushell et al. (2017) providing a literature review that summarizes climate action narratives down into seven attitudes: *gore, alarmism, breakdown of complexity, distancing, green living, debate and*

scam, and *carbon-fueled expansion.* Each attitude detailing the driving motivations, but also the positive and negative consequences found in their literature review.

Bushell's seven climate action narratives attempts to discern the current action gap on climate change, how current policies deviate so greatly from the 2015 Paris Agreements targets. "Gore", the first narrative identified, covers audiences that focus not on climate change itself but the evidence for its existence. Deriving its name from the documentary *An Inconvenient Truth*, the "Gore" narrative seeks to undo any ambiguity within climate change discussion by establishing that the science is settled. The second narrative, Alarmism, is commonly found within activist groups and non-profits that puts emphasis on a catastrophic future that awaits humanity. This narrative has been proven effective in drawing people's attention to an issue, but ineffective in creating "genuine personal engagement" (Bushell et al., 2017, pg 43). The third narrative, Breakdown of Complexity, focuses much more on personal responsibility, solidarity and accountability. This narrative, however, does struggle with the scale of climate change, and the realities of some actors/institutions having an overwhelmingly higher impact that any individual. The fourth, Distancing, is the only narrative that places non-humans at the centre; deriving its name from the distant effects that climate change has on animals such as polar bears in their habitats. Images of habitats being destroyed can unintentionally cause fatigue amongst audiences and create a "distancing" effect between them and the effects of climate change. The fifth narrative, Green Living, focuses on drastic lifestyle changes through alternative technologies, changes in behaviour and consumption patterns. Unsurprisingly, this narrative comes the challenge of resistance, "most notably because they ask individuals to deviate from the social norm" (Bushell et al., 2017, pg 44). The sixth narrative, Debate and Scam, is one of two narratives that puts the focus on obstructing climate action. Leveraging the openness of scientific debate and outright claiming that climate change is a myth posited by those with an agenda. The last narrative, Carbon-Fueled Expansion, places the economy first and argues that climate change mitigation is expensive and hinders economic growth.

As observed, the subjectivity inherently present within narratives can be detrimental regarding "meaning, desires and interests ascribed to future visions" (Dobroć et al., 2023, pg. 3). As this research attempts to discern Aardehuis's socio-technical compatibility with becoming a community microgrid, the politization and contestation of ideas must be highlighted and kept in mind.

3. Conceptual Framework

This section outlines the conceptual base for the framework developed in this investigation. Starting with the definition of the two theoretical concepts employed: strategic niche management (SNM) and narrative analysis. Each concept's core pillars are then leveraged into a novel framework called the strategic niche-narrative analysis (SNNA), serving as a tool to analyze existing niches with the purpose of identifying motivations and resistances for leveraging new innovations within.

3.1. Strategic niche management

Strategic Niche Management (SNM) is a "tool to support the societal introduction of radical sustainable innovations" (Mourik & Raven, 2006, pg. 4), working under the assumption that these radical changes start in early niche markets. First developed in the 1990s by the University of Twente and the University of Maastricht, it studies the links between technological and socio-economic changes (Hoogma et al., 2002). SNM is often implemented alongside a multi-level perspective as another method for analyzing the interactions between three separate levels of transition: the niches, the regime, and the landscape (see Figure 2. The levels of MLP (Frank W. Geels, 2002).). The niche is the layer within our world that is conducive to experimental projects, specialized markets, and radical novelties (Mourik & Raven, 2006). They are also characterized by their need for special protection and circumstances to be nurture, and eventually establish building blocks for broader societal changes (Syarifah, 2010). The regime comprises of a collection of niches, working as collections of rules, beliefs, and organizational structures that dictate unify technological advancements (Mourik & Raven, 2006). The phrase "socio-technical regime" is of note when addressing regimes, which is best described as the ruleset in a complex web of procedures that affect the ways of handling technologies, people, and ways of defining problems (Roland, 2016). The landscape acts as the overarching context of socio-technical regimes, or the status-quo. From the outside, landscapes provide the context for niches and regimes to deviate from, and "includes processes that span societal functions and unfold autonomously of socio-technical regimes" (Smith et al., 2010, pg. 411). Meaning that they are not reliant on niches or regimes, and provide the most basic guidelines for methods of providing for a society (Frank W. Geels & Schot, 2007).
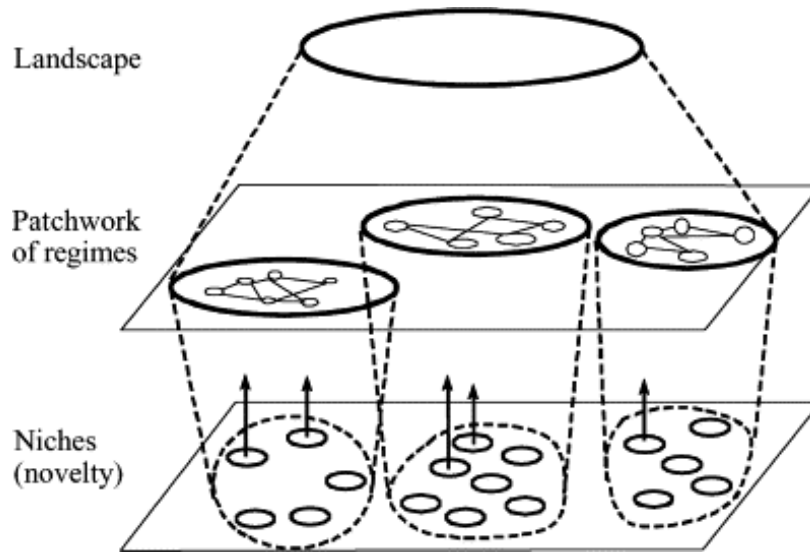
Figure 2. The levels of MLP (Frank W. Geels, 2002).

Proponents of SNM have implemented this tool within multi-level perspective to identify three interrelated processes that niches engage with, become part of the regime, and eventually promote change in the landscape. The three processes, detailed by Mourik & Raven (2006) are: voicing and shaping of expectations, building of social networks, and learning process. However, this paper adheres to the nomenclature proposed by van der Laak et al. (2007) of *Visioning*, *Networking*, and *Learning*.

Visioning identifies three levels in which expectations are shaped (Mourik & Raven, 2006). The first level entails the expectations of the niche itself, focusing on the problem and the specific technology to address them. The second level considers expectations on a regime level, with the stakeholders engaging in function-oriented, abstract work that projects the niche's influence onto the regime. The last level deals with the landscape level, in which a broader consideration of the technology takes place. The consideration of expectations, and what the stakeholders envision, is done to facilitate the creation of a shared agenda, as well as to streamlines research, increase quality of designs, and identify crucial managerial elements (resources, actors, expertise, etc.) (Mourik & Raven, 2006). Investigating this shared agenda, the individual visions, and their (mis-)aligned reality allows for a glimpse into the perceptions and expectations that de Aardehuis elicited within their own stakeholders.

Networking, in accordance with both Mourik & Raven (2006) and van de Poel (2000), is built upon both insiders (in respect to the niche), and outsiders. These outsiders are further expanded upon as institutions, experts, and societal groups. The insiders of the niche benefit from the creation of a network as that entails the unification of expectations explored in visioning, and a substantial cooperation amongst themselves and outsiders (van De Poel, 2000). Regarding outsiders of the niche, both firms and experts mobilize knowledge and expertise to the project, with firms also having the capability of providing managerial tools and financial resources. Societal groups, unlike the other two outsiders, mostly do not mobilize resources, knowledge, expertise, or financial

benefits. However, they are crucial in swaying public opinion in favor, or against, the niche (Mourik & Raven, 2006). For this research, networking is explored to gain insight into how insiders converged expectations and how the community engaged and current engages with outsiders.

Learning, the last interrelated process, is primarily implemented in SNM through the strategies of learning-by-interacting and learning-by-using, that feed into a larger 4-phase process. Learning-by-interacting entails promoting network interactions and using their inputs to improve innovations (Mourik & Raven, 2006), while learning-by-using focuses on taking said input/feedback to improve the design process behind the innovation (Kline, 2009). These strategies are then applied in-tandem with a 4-phase process of: 1) practical and concrete experiences, 2) reflecting upon the experience, 3) aggregating the generalized experiences and 4) translating these aggregates onto new local projects (van den Bosch, 2006). It is this research's goal to explore, among other elements, how this process of learning manifests within the stakeholders of de Aardehuis both in its construction phase, and with its new energy-oriented projects.

3.2. Narratives analysis

A narrative analysis refers to a "cluster of analytic methods for interpreting text or visual data that have a storied form" (Figgou & Pavlopoulos, 2015, pg. 546). According to them, approaches in this form of analysis are usually categorized based on their focus on either the narrative itself, or the structure surrounding it. Investigating the stories being told, and which structures are considered fall under a narrative's ability to achieve "particular communicative aims" (Figgou & Pavlopoulos, 2015, pg. 546). In addition, Kohler Riessman (2008) argues for the expansion of narrative analysis into considering who is constructing it as well. This research, therefore, employs all three to define a narrative as comprising of three core elements: *Stakeholders*, S*tructures*, and S*tories*. With the analysis hereafter concerning itself with the uncovered narrative's inclusivity, strategic characteristics, and emotionally drive, or affective, reasoning (previously introduced in Section 2.1.1).

A critical part of any energy transition project, and especially for the case of a community microgrids, is that of *Stakeholders*, identifying them, and outlining their expectations. Narratives within energy and climate research affirm the need for stakeholder engagement, acting as the "intersection of nature, humanity, and technology" (Moezzi et al., 2017, pg. 1). Therefore, a successful narrative must be able to identify core stakeholders, and their perceptions of the project they engage with. For the purposes of this research, the element of stakeholders is contextualized by their relation to the niche (de Aardehuis) and categorized into *inner* and *outer stakeholders*. These two categories proves useful in understanding the actors within Aardehuis, how they interconnect (Dobroć et al., 2023), and lends the research trusted insider knowledge that is crucial for strategic narratives (Bushell et al., 2017). As this investigation tackles a realized niche, exploration of the *expectations* as the project first developed proves useful in drawing a baseline understanding of congruency and can be used to draw parallels to the possible affective actions taken (Roelvink & Zolkos, 2011). Finally, the expectations of stakeholders also help discern the formation of identity within the community (Meisch, 2019) and how inclusive this identity is.

The second element identified as crucial to a narrative analysis is that of the **Structures** at play. Defined, in this research, as *rules*, established *cultural norms*, and *resources* present within the socio-technical regimes and niches (Hermwille, 2016). A closer look into rules and resources, which encompasses institutional regulations and material/monetary conditions found in the niche, regime, and landscape, adds more complexity to the narrative and further dives into its interconnectivity (Dobroć et al., 2023). Cultural norms, on the other hand, reflects the beliefs and behaviors held by Aardehuis and its relevant stakeholders, with an emphasis in mapping out its complex relation with sustainable efforts (Verlie, 2019) and how the community can leverage that social influence to achieve specific aims (Bushell et al., 2017). Viewing narratives from the point of view of structures presents a duality whereby stakeholders draw on structures to produce action, which inevitably changes or reaffirms these structures (Stones, 2017). This phenomena, referred to as "structuration theory" claims that structures serve as both the medium and outcome of stakeholder action (Pozzebon, 2007) and that the three types of structure (rules, cultural norms, and resources) work to both constrain and enable stakeholders (Stones, 2017). Another reason for considering structures by their own comes from literature that defines narratives as "a means to build a bridge between the micro-structure of the individual and the macro-structure of collective" (Hermwille, 2016, pg. 239).

The final pillar of this research's narrative, **Stories**, produces a more robust, but ultimately unique, understanding of the current context surrounding Aardehuis. For the purposes of this conceptual framework, the definition of stories present in Section 2.1.1 does not apply, as stories are then defined as driven by a protagonist (Moezzi et al., 2017; Dobroć et al., 2023). Instead, **Stories** hereafter relate to experiences*, decentralization,* and contextuality of Aardehuis. The experiences recounted by stakeholders relay their affective insights (Roelvink & Zolkos, 2011), and the generation of social knowledge through learning (Dobroć et al., 2023), which may manifest as protagonist-centred. Decentralization relates to the energy trend described by Green (2016), a core pillar of microgrids, and is relevant to this research because of Aardehuis' recent efforts in become more self-sufficient (see Section 2.1.1). This sub-element of stories also explores the moral elements attributed to microgrids (Marschütz et al., 2020), is highly dependent on what technology is being considered within the research. Lastly, contextualization acts as a benchmark for the narrative analysis in relation to Bushell et al. (2017) seven narratives, and how the accompanying affective reasoning can present opportunities and challenges to the community in employing a microgrid.

3.3. Strategic niche-narrative analysis

This research combines the three processes of SNM, and the three elements highlighted from the narrative analysis to formulate its own framework. From which a niche can be studied in relation to its acceptability of, and synergy with, another niche innovation. Integrating **Visioning**, **Networking** and **Learning** to **Stakeholders**, **Structures**, and **Stories** is done deliberately and with attention to its relevance to the research question (see Section 1.3). The three core elements of a narrative (**Stakeholders, Structures** and **Stories)** are explored through their respective sub-elements outlined in Section 3.2, and individually evaluated by their impact on the processes of

SNM. With the resulting analysis synthesizing, or compiling, a narrative tailored to the context of niche development, structured in accordance with narrative analysis concepts introduced in both sections 2.1.12.1.1 and 3.2. The strategic niche-narrative analysis (SNNA) framework is created with the end-goal of facilitating the discussion of how the narratives within Aardehuis can be seen as useful for the development of a community microgrid.
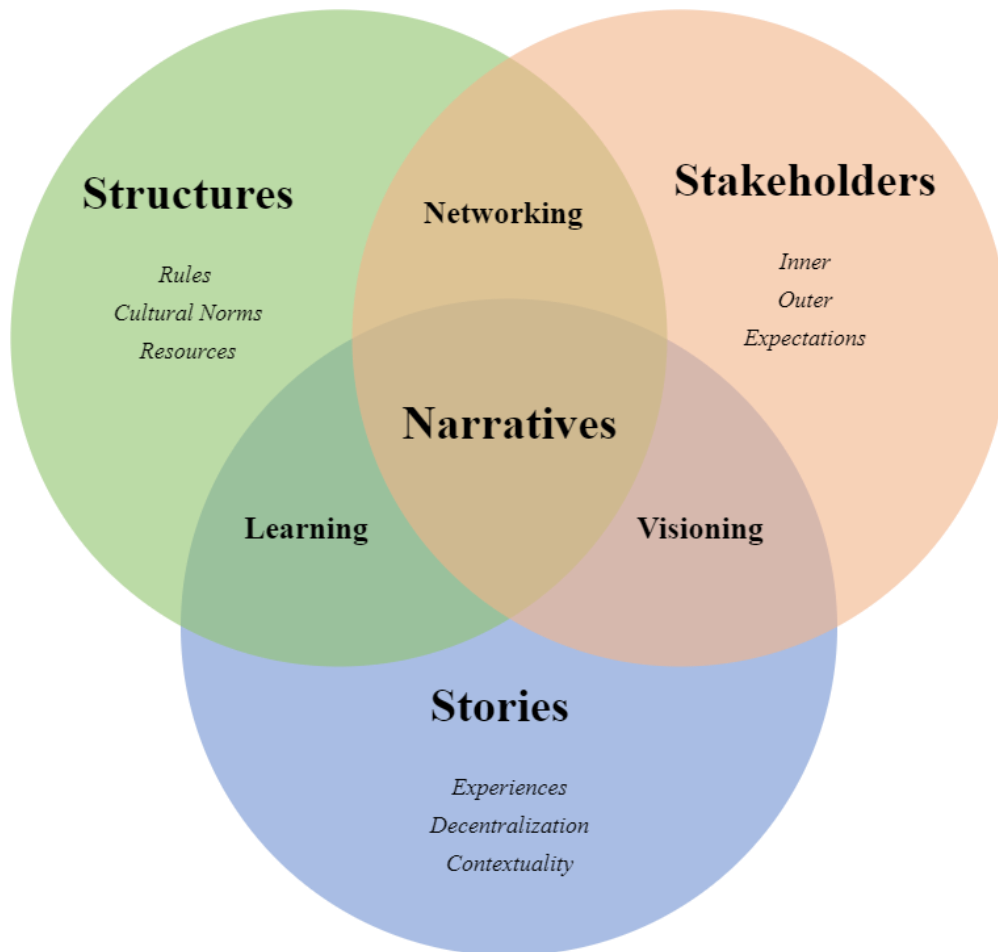
Figure 3: The Strategic Niche-Narrative Analysis framework.

The ***Stakeholder*** element of the narrative employs the exploration of both inner and outer stakeholders of the niche, and their expectations related to the project early-on. For these reasons, the strategic niche-narrative framework studies this element's impact on both ***Visioning*** and ***Networking*** processes. The process of learning is deliberately left out of this element to afford it more analytical room within stories. SNM argues that outer stakeholders hold one of three primary roles regarding the niche: firms, experts, and societal (pressure) groups (van De Poel, 2000). Grouping the outer stakeholders based on SNM's categories provides more insight into the span of Aardehuis' network and identify possible bottlenecks. Inner stakeholder engagement is then observed through how the respondents view de Aardehuis' own inner machinations, leadership roles, capacity to integrate newcomers, and the flexibility of ideas found within Aardehuis. In

addition, networking relies on the fostering of radical innovation networks requiring a variety of stakeholders ranging from newcomers, incumbents, dedicated network builders and reactive actors (van de Poel, 2000). Lastly, visioning contextualizes the case of Aardehuis with that of other eco communities (regime), and the country's current direction (landscape). From these, the research evaluates the congruency of visioning.

The **Structures** found within Aardehuis' stakeholders provide insights into how rules, cultural norms, and resources play a role in facilitating (or complicating) the processes of **Networking** and **Learning**. Exclusion of visioning within the structures of this framework's narrative affords a greater focus onto matter of fact that the other elements do not necessitate. To best analyze the rules reported by the respondents, a separation between external and internal rules is needed as these provide differing insights into the SNM processes of networking and learning, respectively. Cultural norms, unlike the rules outlined before, do not benefit from strict internal and external categorization. The primary answers from stakeholders juxtapose landscape and niche cultural norms. This analysis further taps into the connections between cultural norms, SNM process of networking and learning, and the presence of structuration theory. An analytical understanding of resources employed to create and maintain Aardehuis relies on the presence of networking and is informed by hindsight and learning-by-doing. This allows for an overview of the material conditions for the project's development, and a glimpse into future projects or similar undertakings.

Lastly, the **Stories** of this investigation's narrative establishes its merits based on how it affects the processes of **Learning** and **Visioning**, pulling focus away from realized networks and fostering more abstract thinking. An analysis of the experiences conveyed by the respondents can further elucidate details regarding both visioning and learning-by-doing. This specific sub-element benefits from long-term exposure to the community, and its corresponding analysis relates critical reflection and multi-level contextualization to the community's own learning processes and visioning, respectively. A significant part of the narrative build-up of stories requires discerning the thematic elements of main characters, places, and artefacts to facilitate understanding their interconnectedness (Dobroć et al., 2023). For this research, decentralization incurs the grouping of all benefits, drawbacks, pre-existing knowledge and regime or landscape context that relate to the community's visioning and learning of microgrids. Finally, unlike the other sub-elements of the narrative analysis, contextualization is presented to benchmark stakeholder input to the larger topics of Bushell et al. (2017)'s seven generalized attitudes and relate the predominant ones to their shortcomings.

Compiled into one analytical tool, the SNNA ties together the process-oriented SNM and the people-oriented narrative analysis. Taking characteristics of both frameworks, this research demonstrates how SNNA can marry SNM's focus on the feasibility of innovative technologies (Mourik & Raven, 2006), with narrative analysis' tendency for particularity based on audience and context (Kohler Riessman, 2008). This results in a framework that places stakeholders' perceptions center-stage while maintaining the goal of promoting a new technological innovation.

4. Methodology

This section describes the operationalization of the investigation. The chapter begins an overview of de Aardehuis as a community, followed by the relevance of semi-structured interviews within the context of strategic niche-narrative analysis. Afterwards, the data collection and interview processes are outlined, concluding with the data analysis.

4.1. Case selection: de Aardehuis

De Aardehuis is a unique ecological housing project inspired by the principles of Earthship architecture developed by Michael Reynolds. This style of building prioritizes construction with recycled and sustainable materials, integrating heating, water, and power to the design process (Aardehuis, n.d.). Located in Olst, the project began in 2011 and was completed in 2015, consisting of 23 homes and capable of providing 32% of their own electricity needs through solar panels (de Graaf, 2018). The initiative gained significant momentum with the support of local volunteers and eco-enthusiasts, and now stands as an example of what eco-friendly living can look like, integrating renewable energy, rainwater harvesting, and waste recycling systems. This research classifies de Aardehuis as a "niche" due to its unique architecture (see Figure 4), contextualizing it within other eco-villages that make up the "regime" that is theoretically explored in Section 3.1. Beyond this categorization, this section further explores Aardehuis' organization, stakeholders, and recent developments.

Figure 4: Aardehuis community overview (Aardehuis, n.d.)

A rudimentary search of the name "Aardehuis" leads to the homepage of their project. From this website, the community provides an outline of what the project entails: the 2,000 volunteers, €5,500,000 in investment, and the 10 years it took "from construction to realization" (Aardehuis, n.d.). "The story" section of the website presents three distinct periods of construction:

"Preparation phase", "Organization during construction", and "Construction phase". From its preparation phase, Aardehuis highlights three important "cooperation agreements" consisting of 1) the municipality of Olst-Wijhe accepting Aardehuis' Collective Private Commissioning (CPC) project, 2) SallandWonen social housing cooperation and the development of three rental homes within the community, and 3) BAM Woningbouw in facilitating the sourcing of materials and safety instructions for building. The organization and construction phase outlines what the CPC entails (the ability to jointly purchase land, choose participants and be their own project developer), but also outlines the internal organizational structure of Aardehuis as a sociocracy. A sociocracy is best described as a decision-making process based on values of equality and effectivity through consensus (de Graaf, 2018). Lastly, the construction phase speaks to the professional help brought onboard to accelerate the project, in the form of three construction coordinators, and a De Bouwadviseur, a construction consultancy.

Unmentioned on their website is the recent partnership between Aardehuis and the Sustainable and Integrated Energy Systems in Local Communities (SERENE) project. Responsible for 13 "partners" within Denmark, the Netherlands and Poland. This project is funded by the European Research Executive Agency's Horizon Europe fund (Horizon Europe, 2024) and part of the BRIDGE Horizon2020 initiative (Commission et al., 2023). Working with Aardehuis, the University of Twente and Saxion University, the project established several technologies and structures; hybrid heat pumps, photovoltaic installations, battery storage and battery management systems (see Figure 5), energy trading with neighbors, smart grid control and EV charge-sharing systems (SERENE, n.d.). Consequently, it is fair to conclude that there is a conscientious move towards further enhancing the electrical infrastructure of Aardehuis, and this is the point of inflection on which this thesis' analysis relates to the previously introduced microgrid communities, as outlined in Section 2.1.1. This knowledge of Aardehuis acts as a basis for the way in which this niche organized itself, which stakeholders are involved, and recent microgrid-related developments. What is left to explore is how residents and stakeholders can expedite this process through the narrative they have developed.

Figure 5: Aardehuis' new electrical panel (left), batteries and management systems (right). Taken by researcher.

4.2.   Data collection

The use of semi-structured interviews with the strategic niche-narrative analysis framework stems from the need to obtain subjective and qualitative data from relevant stakeholders and promote an environment that is conducive to open conversation. From the perspective of microgrid propagation, literature states that no two microgrids, even within the confines of a community microgrid, are the same (Ton & Smith, 2012; Uddin et al., 2023; Hirsch et al., 2018). Therefore, to identify which elements can help propose and develop a microgrid within Aardehuis, this investigation follows the trend established by other narrative literature of interviewing (Howarth, 2017; Moezzi et al., 2017; Hermwille, 2016).

The community and those involved in each of the three cases have already overcome significant challenges to establish these niches and therefore have engaged in drastic change (Mourik & Raven, 2006). By approaching the strategic niche-narrative analysis from the perspective of contemporary stakeholders instead of literature, this research can stipulate how Aardehuis may address challenges that community encounter in their development of microgrids. These being primarily community engagement (Koirala et al., 2016), unity in vision, and expectations (Warneryd & Karltorp, 2022). Lastly, by getting responses from stakeholders within this community, this research ensures that narrative information obtain is contextually trustworthy and respectable as applicable to the members of Aardehuis, based on the characteristics of strategic narratives (Bushell et al., 2017).

Stakeholders involved with Aardehuis were asked to partake in these semi-structured interviews lasting approximately 30-50 minutes, with priority given to residents of the communities and stakeholders that were present during the initial development. The interview setting catered to the availability of each stakeholder, with some preferring in-person while others opting for online. Regardless, these were fully recorded, and anonymized.

4.2.1. Interview procedure

The interview questions are broken down into three main processes introduced in Section 3.1: **Visioning, Networking** and **Learning**. The three processes of SNM guide the structure of interviews due to their iterative nature and interconnectedness. The questions are crafted so that the interviewees may comment on characteristics that relate to both past and present undertakings of Aardehuis, while also providing the opportunity to comment on microgrids and decentralization in terms of energy, and how their perspectives may have changed in time. Each candidate was sent a copy of the interview guide (found in Appendix B – Interview Guide) with an overview of the thesis' purpose and guiding research question (not included in Appendix B). The interview process adheres to the following order: 1) Introduction, 2) Visioning, 3) Networking, 4) Learning, and 5) Concluding Remarks.

The ten individuals interviewed as part of this research have direct ties to de Aardehuis, though the extent of this relation varies slightly. Eight of those interviewed are full-time residents, of which six have been part of the community since the beginning, and two joined it around two years

ago. Of the two non-residents, one worked in the construction of Aardehuis, was involved as a consultant for Metabolic with another community microgrid in Amsterdam and is categorized as "Mixed" since they have relatives that live in Aardehuis. The last one is part of the municipality of Olst-Wijhe and works to promote sustainable practices within the village. Table 2 displays this information in a more accessible manner by indexing the interviews, outlining their relation to de Aardehuis, their time spent engaged with the community and the date of the interviews.

Interview Reference	Inner/Outer	Time Spent (in years)	Date of Interview
Interview-1 (I-1)	Inner	13+	03/06/2024
I-2	Inner	13+	17/06/2024
I-3	Inner	13+	17/06/2024
I-4	Mixed	0.5	17/06/2024
I-5	Inner	2	18/06/2024
I-6	Inner	13+	18/06/2024
I-7	Inner	2	19/06/2024
I-8	Inner	13+	25/06/2024
I-9	Inner	13+	25/06/2024
I-10	Outer	13+	05/07/2024

Table 2: Individuals interviewed, outlining connection, time spent, and date of interview.

Interviews conducted through Microsoft Teams (I-2, I-3, I-7, I-8, I-9, and I-10) take advantage of the built-in "Record and Transcribe" feature which produces both a .mp4 file of the videorecording and a .docx file of the verbatim transcript. Transcripts processed by this method are then cleaned up to remove interjections. The interviews conducted in-person (I-1, I-4, I-5, and I-6), however, are transcribed verbatim by hand and afterwards cleaned up for any unnecessary interjections.

4.3. Data analysis

Every interview, once transcribed, undergoes a preliminary data analysis to simplify and sift through the qualitative aspects that the strategic niche-narrative analysis requires. This process entails the coding of transcripts and a thematic analysis. Each of the sub-elements present within the three narrative elements (and found in Figure 3: The Strategic Niche-Narrative Analysis framework.) are used as the basis for the interview codes. The breakdown of what each code entails can be found in Appendix C – Interview Codebook. Each interview's coding available in Appendix D – Coded Interviews. The last step of this preliminary stage is that of a thematic analysis, which primes the respondent's input to be evaluated by the relevant processes of SNM. This thematic analysis, unlike the rest of the research, is carried out inductively, working from the summaries and responses obtained from each interview's coding. Table 3 shows a breakdown of the thematic analysis which precedes the evaluation of each code in relation to the SNM processes.

The final stage in the strategic niche-narrative analysis encompasses both the data analysis and discussion chapters of this thesis. Each sub-element's thematic analysis is evaluated based on the SNM processes outlined in Table 3. This qualitative evaluation employs both generalized statements of codes, and specific quotes from respondents that ascertain the code's impact on the relevant processes. This is detailed in Section 5 of the thesis, in which the rationale behind the evaluation is presented, followed by a table that compiles the findings into one cohesive excerpt. After every code is treated in this manner, the resulting excerpts are then compiled together in Section 5.4. This synthesized narrative is separated into three main paragraphs, each addressing one of the three narrative elements found in Figure 3.

Code	SNM Process	Predominant Themes	Example
Outer	Networking	Municipality (Olst), Volunteers, Others	*"We had a camping ground here that was allowed by the municipality."*
Inner	Networking	Unity, Social Dynamics, CPC, Decision-Making	*"Collective Private Commissioning. Individuals that get together and decide to build together."*
Expectations	Visioning	Ideation, Community-Living, Uncertainty, Sustainable-Living	*"New neighbors and a new environment, new house, everything new. Start fresh."*
Rules	Networking	Favorable Regulations, Unfavorable Regulations, Internal Structuring, CPC.	*"It's quite difficult to have projects like de Aardehuis in the Netherlands because there is also regulation that limits the price of houses."*
Cultural Norms	Networking & Learning	Awareness, Solidarity, Alienation, Social Cohesion	*"There's a lot of solidarity in the Aardehuis like and you never feel like you're alone."*
Resources	Networking & Learning	Money, Time, Land, Energy (Electricity)	*"We don't have much accommodation for economic activities that can help our community."*
Experiences	Visioning & Learning	Critical Reflection, Continual Advocacy, Regime/Landscape Context	*"There's a lot more that we like about living in a community that compared to what we don't like."*
Decentralization	Visioning & Learning	Benefits, Drawbacks, Pre-existing Efforts, Motivations	*"If every new housing estate would have some kind of microgrid that would sort of help"*
Contextuality	N/A (see Section 3.3)	Gore, Breakdown of Complexity, Green Living, Alarmism, Distancing.	*"That you want to be on Team Planet, you know, and you want to promote sustainable goals or you want to fight climate change."*

Table 3: Thematic analysis breakdown per code.

5. Results & Analysis

The strategic niche-narrative analysis is primarily conducted through an evaluation of the coded interviews (found in Appendix D – Coded Interviews) and the sub-elements listed in Table 3. Each section of this chapter addresses one of the three core pillars of the framework's narrative composition, with sub-chapters analyzing individual codes in relation to their relevant processes of SNM (see Section 3.3 and Figure 3) and tabling the resulting synthesis. Lastly, interviews are referred to regarding their Interview Reference ID found in Table 2.

5.1. Analysis of stakeholders

The following sub-sections (5.1.1., 5.1.2., 5.1.3.) analyze the three codes related to *Stakeholders* in relation to the processes of *Visioning* and *Networking*.

5.1.1. Outer Stakeholders

Throughout the interviews, there is an inconsistency regarding outer stakeholders. Besides the municipality, the only other stakeholder commonly mentioned are the volunteers that aided in the construction of Aardehuis followed by the national government, living corporations, energy corporations and contractors. Both I-1 and I-10 mention SERENE's contributions to Aardehuis' new carport panels and battery system, but most respondents speak of outer stakeholders in abstract form. Societal pressure groups are vaguely mentioned, with both I-5 and I-6 speaking to their personal connections to Extinction Rebellion. Furthermore, I-6 acknowledges the connection between Aardehuis and other eco-communities in the formal Global Ecovillage Network. This inconsistency does not necessarily indicate the lack of a network, only that most of the residents are not aware of all its participants.

Most respondents do make it clear that the municipality of Olst-Wijhe played a critical role in both the initiation and continuation of Aardehuis. The municipality's respondent concurs in this assessment (I-10). Eight of the interviewed name the municipality's involvement. The only ones not to mention the municipality are Aardehuis' newest members (I-5 and I-7) and I-8. Within the references of the municipality, I-1 and I-2 highlight its flexibility, I-3 and I-4 crediting this partnership to a "champion" from within the institution, and I-6 and I-8 approving of the local government's recent initiatives that involve or reflect de Aardehuis' values. I-10 contextualizes the partnership with the municipality as a direct line of contact to Enexis, the grid operator, and from this partnership the municipality also gains help in promoting sustainable thinking within the village.

Code	Analysis
Outer Stakeholders	There is substantial awareness, and corresponding reciprocity with the municipality of Olst-Wijhe in collaborative efforts and maintaining a strong network. Some residents engage with societal pressure groups (such as Extinction Rebellion), but the community does not act in unison in this regard. Furthermore, there is a noticeable absence of experts within the purview of most residents, with outer stakeholders such as SERENE and Enexis eluding most responses. This, in turn, increases the community's perceived reliance on the municipality.

Table 4: Outer stakeholder analysis.

5.1.2. Inner Stakeholders

I-1, I-3, and I-4 make references to the fact that Aardehuis was built on the regulatory framework of a Collective Private Commissioning (CPC) agreement. In addition to this, the community implements a collective decision-making process (referenced by I-2 and I-4) and managed, internally, the division of labor through "working groups" (I-1 and I-8) during its construction process. I-10 notes that dependence on informal leadership is a commonality for such projects and can cause problems of dependency.

Regarding newcomers, a glance at Table 2 quickly reveals that only I-5 and I-7 fit the description while the majority can be categorized as incumbents. Despite this I-5 and I-7 join most respondents in agreeing to a strong feeling of solidarity and unity within the community. Counter-intuitively, an equal number of references are made to the fact that there have been noticeable changes in social dynamics, and growing differences of opinions. Both I-6 and I-9 make these oxymoronic statements which invite a careful look into how they are reconciled, with them arguing that the shift came after the building process once an established baseline of trust was in place. Of the five respondents referencing these changes, only I-2 and I-3 regard them with minor contempt while I-6, I-8 and I-9 speak of a slightly deteriorating social cohesion.

Code	Analysis
Inner Stakeholders	Working under a Collective Private Commissioning agreement, Aardehuis' past endeavors have created a solid foundation upon which the community trusts one another and eagerly welcomes new members. However, differences of opinions and the social dynamics post-construction reveal underlying resistance to new collective agreements.

Table 5: Inner stakeholder analysis.

5.1.3. Expectations

Most respondents, with the exceptions of I-4 and I-10, clearly expected community living to play a major role. Seven of which project quasi-utopic attributes to the project, with romanticized/idealized visions that directly relates to Moezzi's fostering of utopic narratives. I-2, I-5 and I-7's ideations correlate to the unique opportunity afforded by the niche's vision of living, I-6 and I-10's responses primarily address the resource-intensity of the project. I-1, I-8 and I-9 all state having greater hopes for Aardehuis' social cohesion, especially after the project was completed. The only mention of expectations regarding the landscape comes from I-3, who makes it clear they do not see the country adopting the project at a large-scale.

As stated by I-8, "sometimes when I visit [other] projects you sort of wonder why is not this happening? (...) Usually coming down to communication of expectations." (see Appendix D – Coded Interviews, Interview #8), the alignment of expectations proves crucial in developing a niche, and hopefully inspiring others within Olst to think more sustainably (I-10). The initial fears projected by I-10, relating to the village's acceptability of Aardehuis, have been disproven by the community's tenure. Both residents and municipality expect others to see de Aardehuis as a point of inspiration, or "spotlight project" (I-4).

Code	Analysis
Expectations	The community demonstrates an almost-unanimous expectation of regime-level community-living that largely overlaps with niche-related sustainability visioning. Initial apprehension regarding Aardehuis' social impact proved untrue, as the community inspires sustainable thinking. Consideration for the niche was primarily approached from a quasi-utopic perspective, while little regard is given to the community's expected impact on the landscape.

Table 6: Expectations analysis.

5.2. Analysis of structures

The following sub-sections (5.2.1., 5.2.2., 5.2.3.) analyze the three codes related to **Structures** in relation to the processes of **Networking** and **Learning**.

5.2.1. Rules

Most respondents, six of the interviewed, make it clear that current landscape regulations limit the capacity for projects akin to Aardehuis to exist or even further develop. I-1, I-2 and I-6 specifically relate to the regulations pertaining to energy corporations and legislation, while the others relate to other regulations and standards: I-3 generalizes, I-5 speaks to the process of acquiring loans, and I-7 about construction standards that go against de Aardehuis' goals. An overlap, however, is present between I-1, I-2, 1-3 and I-6 as all of them condemn federal

regulations but give credit to the municipality's legislative flexibility regarding their own community. This flexibility is confirmed by I-10, as the municipality collaborated in interpreting regulations in favor of creativity. This outlook on external rules speaks to the mutually beneficial partnership between local government and Aardehuis, solidifying local networks in a favorable way. The unfavorable outlook on federal regulations is highlighted by I-10, but tempered by I-6 and their own connections to the "the alderman of the Dutch Green Party". Furthermore, the informal processes used by Aardehuis are unlikely to change, as the municipality fears formalizing them will threaten aspiring stakeholders (I-10).

Internally, five of the respondents make mention of the fact that de Aardehuis implements a unique decision-making process that requires unanimous approval and consequently provides each resident with veto power. Of the five, four criticize the rule, arguing that its existence leads to "sloppy and chaotic decision-making" (I-4, Rules) or outright "doesn't work if you have a (…) veto power" (I-8, Rules). With I-6 being the only respondent to make mention of the decision-making process with no negative outlook. Beyond the decision-making process, I-2 and I-3 mention the presence of an interview process in the beginning of the project's development that speaks to the internal methodology to validate the initial visioning of the project. However, taking into consideration the prospect of a new development within Aardehuis, the process of visioning may find resistance as their decision-making process is heavily criticized.

Code	Analysis
Rules	The community has greatly benefited from flexible local governance that is willing to bend local rules, with many of the interviewed considering national legislation to be stringent. Furthermore, residents within Aardehuis benefit from informal processes kept by Olst, facilitating the on-boarding of new stakeholders. Internally, the community sees its unanimous approval process as a significant detriment to decision making, which can create resistance to new ideas.

Table 7: Rules analysis.

5.2.2. Cultural Norms

All respondents outline the importance of solidarity and unity within the organization of de Aardehuis, with a focus on shared responsibility (I-1, I-2, I-6, I-8 and I-9), deviating from conventional structures (I-1, I-2, I-3, I-5 and I-7), and promoting voluntary action (I-2, I-6, and I-8). Most that highlight the unity and social cohesion of Aardehuis do so in contrast with larger city's focus on efficiency and general disconnect from nature and people (I-2, I-3, I-4, I-5, I-7, I-8 and I-10). Interestingly, this alienation within larger cities can be interpreted as a medium for more people to engage with community projects like Aardehuis. Providing a clear instance in which current landscape norms directly instigate niche behaviors. This interaction is exemplified in I-2, I-5 and I-7's responses, in which a general dissatisfaction with standard living norms

drove them to consider Aardehuis. Lastly, I-10 clearly credits Aardehuis with a shift in Olst's acceptance of sustainable thinking through its social interactions with the village.

The voluntary nature of Aardehuis, when studied with structuration theory, can help explain why respondents argue that, culturally, they fear rifts in the social homogeneity of the community (I-3, I-4, I-6, and I-8). This voluntary attitude, combined with a non-profit approach (I-1 and I-3), means that individual residents are left to their own devices and with minimal extrinsic incentives to volunteer. During the construction of the community, the motivation to work together stemmed from pre-existing normative beliefs (I-1, I-5, I-6, I-7, I-8 and I-9) and the fact that they were literally building their own homes. Once that period concluded, voluntary participation went from a major benefit to a structure that has shown to work against the community.

Code	Analysis
Cultural Norms	Cultural norms present within Aardehuis point to a satisfactory level of congruence in living, a nuanced understanding of shared responsibility and beliefs that contrast with those of the landscape. This, in turn, positions Aardehuis in a culturally relevant spotlight for Olst as an integrated reference for sustainable living. In addition, the community's tenure has given its residents the time necessary to reflect upon the potential shortcomings in their voluntary internal organization.

Table 8: Cultural norms analysis.

5.2.3. Resources

Internal resources, of which the respondents predominantly recognize money (all but I-9) and time (I-2, I-3 and I-7), reflect the visioning process that took place before building. Monetarily speaking, I-6 provides an initial, incorrect, estimate of "€50,000 for each house", and I-1 claims that the CPC collected 6.5 million euros for the project. However, most other mentions of capital required are kept abstract. Some attribute a high investment cost to the project's success (I-3 and I-8), speak of the financial benefits of utility bills (I-4), or characterize Aardehuis as a non-profit community with few economic actions (I-1, I-2, I-3 and I-6). This congruent economic vision is also put into sharp, generational perspective as I-5 and I-8 speak to the fact that "it's still the older generations that have the funds" and "there are a lot of young people who cannot afford big house and want to."

External resources are slightly more varied, with energy supply/infrastructure and land availability receiving sporadic mentions throughout responses. Mentions of energy supply/infrastructure revolve around plans of decentralization (I-1, I-2 and I-6) and infrastructural needs that relate to the landscape's issues (I-4). These reveal an active stage of learning-by-interacting and learning-by-doing from Aardehuis as they currently have independent water systems (I-10), are expanding their energy infrastructure (I-1, I-6, and I-10),

and have a stakeholder (I-4) that partook in the creation of Schoonschip, a community microgrid in Amsterdam. Furthermore, the references to land usage, specifically the lack of land available for projects like Aardehuis (I-8 and I-9) speak to the strong network the community has with local government and their mutually beneficial collaboration (I-1 and I-10).

Code	Analysis
Resources	The capital- and time-intensity required to complete and maintain de Aardehuis demands a congruency in residents regarding its investment costs and what they can expect in return as a non-profit community. This congruency is upheld, and sporadically related, to current economic circumstances while also acknowledging the benefits provided by the municipality in the acquisition of land for development. Lastly, the community's outlook on energy as a resource is informed by their recent expansions through the SERENE subsidy, and stakeholder's contributions to Schoonschip.

Table 9: Resources analysis.

5.3. Analysis of stories

The following sub-sections (5.3.1., 5.3.2., 5.3.3.) analyze the three codes related to **Stories** in relation to the processes of **Visioning** and **Learning**.

5.3.1. Experiences

As seen in Table 2, most individuals interviewed are long-term residents that have been in Aardehuis since its inception. Within the six respondents that engage in critical reflection, there is a spotlight turned towards the community's current social state. I-1 briefly mentions the presence of benefits and challenges within their current social dynamics, while I-3 and I-6 clearly attribute the end of construction as the tipping point for when those challenges began. The other respondents (I-7, I-8, and I-9) primarily reflect on the intensity of the process, and that they would not attempt a project of this scale again. Thus, it becomes somewhat clear that, during the process of construction, in which learning-by-doing first manifests, the community was bonding. However, by no longer engaging with a process of learning-by-doing, some of its residents have grown indifferent to Aardehuis' decision-making process.

The reflections of Aardehuis are set primarily in contrast with the regime and landscape levels. I-4 compares the bottom-up characteristic of Aardehuis with the expert-led efficiency of top-down projects. I-8 keeps track of similar projects, and doing so has only strengthened their belief that Aardehuis is a "miracle". I-1, I-2, I-5 and I-10 express similar satisfaction with the impact the community had, and I-7's experience was overall positive, but they contextualize Aardehuis to the landscape, and conclude that "this idea is a step too far for treating it on a bigger scale". I-1

reconciles the community's niche architecture and landscape-scale by proposing a shift away from houses that have "many forms, which makes it difficult to build". Lastly, I-10 reflects on the positive impact Aardehuis had in the village of Olst but disagrees with the "DIY" attitude for large-scale implementation. This shows clear satisfaction and congruence from stakeholders at the niche level, but significant discordance surrounding the impact Aardehuis could have at the landscape level.

Code	Analysis
Experiences	Critical observations from respondents place a spotlight on the current social cohesion, as the community saw strong bonds form during construction. Ever-since 2014, however, its residents feel noticeable changes in internal engagement. The municipality credits the community with an increase in sustainability awareness within Olst which aligns with respondent's perceived impact of de Aardehuis. The main incongruences in experience are those regarding landscape impact and implementation.

Table 10: Experiences analysis.

5.3.2. Decentralization

From all responses that relate to the code of decentralization, only I-5 fails to engage with the benefits and/or drawbacks of implementing more measures to improve Aardehuis' energy infrastructure. I-1, I-3, and I-8 argue that the implementation of a microgrid could only deepen the core values of sustainability and self-reliance that Aardehuis promotes and make it a greater example within the regime. I-2 and I-10 refer to the increase in resilience of the community, and how that relates to possible challenges at a landscape-level. I-4, I-6, I-7 and I-9 all compound the drive to establish a microgrid as a means of circumventing infrastructural problems, and as a logical next step for the community. Among those that do provide drawbacks for microgrid expansion, I-1 worries about the relinquishing of energy-sharing with Olst, misinformation about the functionality of microgrids (see Section 2.1). I-7 speaks to the realities of decentralization and sustainability, arguing that current regulations and requirements complicate the process. I-8 demonstrates concerns over Aardehuis' dependance on solar energy, and I-9 over the decision-making process necessary to establish such a project. It is worth noting that I-10 offers some reprieve to I-7's apprehensions, stating in respect to microgrids that they "can help them out because of the energy crisis being more urgent now".

The establishment of a community microgrid can also take advantage of the learning processes that its residents engage(d) with. I-1 and I-9 refer to the independent water treatment systems found within Aardehuis, drawing a connection between that undertaking and the expansion into energy. Furthermore, I-1, I-2, I-8, and I-9 mention the most recent solar roof/battery system project as an example of existing efforts towards decentralization, with I-3 being the one that proposed it. This indicates a degree of learning-by-doing, as the community has begun the

process of working with energy. This experience is of great importance to the development of a potential microgrid, as it lays the technological foundation for fully integrated energy infrastructure.

Code	Analysis
Decentralization	The stakeholders demonstrate curiosity and highlight the possible benefits of establishing a microgrid within Aardehuis, making it more self-sufficient. This vision is substantiated by fears of infrastructural shortcomings, improved community resilience, and municipal support. Furthermore, the pre-existing artefacts related to electrical infrastructure, combined with experience with a self-sufficient water system proves Aardehuis' exposure and active learning process that is applicable to microgrids.

Table 11: Decentralization analysis.

5.3.3. Contextuality

All respondent's express awareness of climate change, its impacts, and Aardehuis' exemplification of sustainability in living. Except for I-5, I-8 and I-9, respondents explicitly speak to the need for more community-driven initiatives as an effective method of addressing climate change. None of the residents express doubts regarding the scientific consensus on climate change, with I-6 specifically referencing the movie "An Inconvenient Truth" as a driver in the construction of Aardehuis. The "Gore" narrative presented by Bushell does present shortcomings in the form of scientific criticism, and lack of motivation despite awareness.

Two other overarching narratives, with equal amounts of overlap in respondent's answers are that of "Green Living" and "The Breakdown of Complexity". With respect to "Green Living", I-1, I-2 and I-6 credits de Aardehuis' value of living in harmony with nature as one of the reasons the project was successful in its development. Furthermore, an overlap is seen with between respondents I-1, and I-8 as they also mention the fact that Aardehuis enabled them to experience sustainable change. This sentiment is expanded upon by I-5, I-7, and I-9 with explicit mentions of how this community taught them about "green rules" and stands as an example of how to create sustainable change.

Some other outlying responses hint at the nuance in the community's views of climate change action, particularly related to prospects and engagement. I-3 and I-4 touch upon the fact that living and collaborating with Aardehuis has increased their sense of urgency of climate change, with I-4 specifically calling their vision for the future as "grim". These responses line-up with the "Alarmist" rhetoric and even though its efficient at drawing attention, Bushell et al. (2017) warns of the possible alienation felt by those who posit it when faced with overwhelming hopelessness. Lastly, I-2 and I-9 touch upon a growing sense of "Distancing" found within Aardehuis. The former explicitly avoiding the news cycle to avoid the negative affects this

brings, and the latter claiming that some residents within the community have stopped engaging with sustainable thinking.

Code	Analysis
Contextuality	All those interviewed demonstrate a clear understanding of the seriousness of climate change. A majority propose community living as a relevant means of directing addressing the crisis, while others see it as a means of realizing and simplifying change. A similar consensus is found in the value of "Green Living", yet within these overarching narratives the presence of distancing poses threats to internal engagement.

Table 12: Contextuality analysis.

5.4. Synthesis of Aardehuis' narratives

The following text boxes are the synthesis of each of the strategic niche-narrative analysis elements, color-coded in reference to Figure 3. Together, they create what this investigation considers to be the overarching narrative of de Aardehuis.

Stakeholders

The community of Aardehuis, and its stakeholders, demonstrate substantial awareness, and corresponding reciprocity with the municipality of Olst-Wijhe in collaborative efforts and maintaining a strong network. Some residents engage with societal pressure groups and outsider experts (such as Extinction Rebellion and the Global Ecovillage Network), but the community does not act in unison in this regard. Furthermore, there is a noticeable absence of experts within the purview of most residents, with outer stakeholders such as SERENE and Enexis eluding most respondents. This, in turn, increases the community's perceived reliance on the municipality. Working under a Collective Private Commissioning agreement, Aardehuis' past endeavors have created a solid foundation upon which the community trusts one another and eagerly welcomes new members. However, differences of opinions and the social dynamics post-construction reveal underlying resistance to new collective agreements. The community demonstrates an almost-unanimous expectation of regime-level community-living that largely overlaps with niche-related sustainability visioning. Initial apprehension regarding Aardehuis' social impact proved untrue, as the community inspires sustainable thinking. Consideration for the niche was primarily approached from a quasi-utopic perspective, while little regard is given to the community's expected impact on the landscape.

Structures

The community has greatly benefited from flexible local governance that is willing to bend local rules, with many of the interviewed considering national legislation to be stringent. Furthermore, residents within Aardehuis benefit from informal processes kept by Olst, facilitating the on-boarding of new stakeholders. Internally, the community sees its unanimous approval process as a significant detriment to decision making, which can create resistance to new ideas. Cultural norms present within Aardehuis point to a satisfactory level of congruence in living, a nuanced understanding of shared responsibility and beliefs that contrast with those of the landscape. This, in turn, positions Aardehuis in a culturally relevant spotlight for Olst as an integrated reference for sustainable living. In addition, the community's tenure has given its residents the time necessary to reflect upon the potential shortcomings in their voluntary internal organization. The capital- and time-intensity required to complete and maintain de Aardehuis demands a congruency in residents regarding its investment costs and what they can expect in return as a non-profit community. This congruency is upheld, and sporadically related, to current economic circumstances while also acknowledging the benefits provided by the municipality in the acquisition of land for development. Lastly, the community's outlook on energy as a resource is informed by their recent expansions through the SERENE subsidy, and stakeholder's contributions to Schoonschip (a community microgrid located in Amsterdam).

Stories

Critical observations from respondents place a spotlight on the current social cohesion, as the community saw strong bonds form during construction. Ever-since 2014, however, its residents feel noticeable changes in internal engagement. The municipality credits the community with an increase in sustainability awareness within Olst which aligns with respondent's perceived impact of de Aardehuis. The main incongruences in experience are those regarding landscape impact and implementation. The stakeholders demonstrate curiosity and highlight the possible benefits of establishing a microgrid within Aardehuis, making it more self-sufficient. This vision is substantiated by fears of infrastructural shortcomings, improved community resilience, and municipal support. Furthermore, the pre-existing artefacts related to the SERENE project, combined with experience in self-sufficient water system proves Aardehuis' exposure and active learning process. All those interviewed demonstrate a clear understanding of the seriousness of climate change. A majority propose community living as a relevant means of directing addressing the crisis, while others see it as a means of realizing and simplifying change. A similar consensus is found in the value of "Green Living", yet within these overarching narratives the presence of distancing poses threats to internal engagement.

6. Discussion

This section discusses the findings in Section 5. and dives into the overarching narrative found in Section 5.4. to answer the three research sub-questions and main research question found in Section 1.3. Furthermore, the limitations of this study alongside the insights from developing and implementing the strategic niche-narrative analysis are outlined.

6.1. Answering the research sub-questions

i)   *"How do insider and outsider stakeholders engage with de Aardehuis?"*

Answer: Both outer and inner stakeholders primarily engage through pre-existing networks that rely on a small number of individuals from Aardehuis to maintain and expand, demonstrating a uniform vision of what Aardehuis is, but not necessarily of who helped build it.

Through-and-through there is a consistency in vision and interest that both insiders and the municipality demonstrate towards de Aardehuis. However, these pre-existing networks are maintained by a small group of inner stakeholders. The same respondent that partakes in the external communications group within Aardehuis (I-6, Inner Stakeholder) is also part of the Global Ecovillage Network, initiated de Aardehuis project, and is in contact with representatives of the Dutch Green Party. Furthermore, only two of the interviewed demonstrate a connection or awareness of the SERENE project (I-1 and I-4) which speaks to major deviations in the individual narratives of who the outer stakeholders are. Only I-5 makes mention of SallandWonen and no one mentions BAM Woningbouw or De Bouwadviseur (see Section 4.1). One possible explanation for this can be found in Meisch's *narrative ethics*, with the inner stakeholders of Aardehuis forming a strong identity stemming from their years of involvement. This, by its own, is not detrimental to the community's engagement, but can lead to the minimization of importance from others that the community does not see as their own (Meisch, 2019). The municipality also warns that a great level of dependency on individual leadership is potentially harmful (I-10, Inner Stakeholders) as it confers a lot of influence to a small number of people. However, this form of leadership has precedence within Aardehuis, as it is seen in early developments of the community, with what is described as the presence of a "champion" within the municipality (I-4, Outer Stakeholders).

Having these singular points of contact within Aardehuis is particular important to the prospects of developing a community microgrid, especially when considering the community's own engagement of its residents, or its *internal engagement*. Simply put, lack of internal engagement puts the energy solution at a significant disadvantage of development and realization when compared to other forms of integrated community energy systems (Koirala et al., 2016). A significant amount of those interviewed reported changes in participation of inner stakeholders in meetings (Section 5.1.2 and 5.2.1.) which can lead to a general degradation of Aardehuis' internal engagement on two fronts: disinterest in collaboration, and disinterest in their network.

ii)   *"What structures currently exist that work in favor, and against, the community?"*

Answer: De Aardehuis has at its disposal internal rules and changes in behavior that create some friction; external institutions that seem eager to aid them, a history of high investment costs and current pre-existing infrastructure that can all affect the potential development of a microgrid.

The sociocratic nature of Aardehuis is one aspect that, when mentioned by interviewees, is mostly brought up in the same breath as discontent and frustration. Though the profile done by de Graaf does specify that Aardehuis is "split into different circles, each with their own specific responsibilities" (de Graaf, 2018, pg 17), the reality for a significant number of interviewees is that consensus must be reached amongst all members. This creates sentiments akin to "sloppy and chaotic decision-making" (I-4, Rules). Therefore, internally speaking, the decision-making processes currently employed are a point of friction for some of Aardehuis' residents. This, in turn, can help explain changes in internal engagement experienced after the residents finished building (Section 5.2.2). The presence of a "veto power" (Section 5.2.1.), which impacted the progress of the SERENE-backed project (I-9, Decentralization), demonstrate a contemporary example of residents' discontent with current decision making that has affected their energy development. However, while inner rules may underpin contentious feelings, the narratives stemming from Aardehuis do paint a different picture with regards to other structures that may work in favor of a microgrid development.

As presented in Section 5.4., all stakeholders demonstrate awareness to the importance of the municipality of Olst-Wijhe during the construction of Aardehuis. This specific point is also leveraged by the municipality's own stakeholder interviewed, as they address the possibility of establishing a community microgrid and how the municipality is interested in fostering such ideas (I-10). This point is of particular interest to those interviewees that concern themselves with general legislative bottlenecks (I-1, I-2, & I-6). Furthermore, the self-sufficient water treatment system Aardehuis employs (I-1 & I-9) is a key part of the initial construction of the community that helps distinguish themselves from the regime. This concern for decentralization can prove helpful for the acceptability of community microgrids within its stakeholders and is further reinforced by the presence of the SERENE partnership. Although the SERENE project does not outright attempt to establish a community microgrid within Aardehuis, the project's goal is "to establish locally integrated 'energy islands' in different villages" (SERENE, n.d.), an expression that recalls Ton & Smith's definition found in Section 2.1. Furthermore, given the €5,500,000 investment needed to create Aardehuis (Aardehuis, n.d.), the possibility of financially benefitting from developing a microgrid may help alleviate the inevitable investments required. Specifically, the capability of streamlining de Aardehuis "produces more than it consumes" (I-4, Decentralization) profile and further benefit from energy cost savings year-round (Razanousky et al., 2010).

iii) *"What actionable information can be drawn from stories of the development and maintenance of de Aardehuis?"*

Answer: The experiences shared by stakeholders point to a community bound by their labour mostly formalized during Aardehuis' construction, alongside notable interests in evolving their current degree of self-sufficiency and clear precende of engaging in drastic lifestyle changes.

Even though sub-question i) does speak to a deterioration of engagement at Aardehuis, it is incorrect to outright claim that the larger context of social cohesion within and outside the community is degrading. The community shows an almost universal understanding of what Aardehuis currently exemplifies in terms of beliefs and values (Section 5.2.2.), and the extent of the impact the community has at a larger scale (Section 5.3.1.). Stakeholders note that the community functions as an example of what sustainable living can be, with most agreeing with their own mission-statement of "Building, working and living in harmony with nature, in connection with each other and to inspire the world" (Aardehuis, n.d.). This motto can be interpretted as a strategic narrative, which aims to persuade and influence audiences to a particular outcome (Bushell et al., 2017). This influence is particularly interesting when considering the possible implications that developing a community microgrid within Aardehuis may bring. Even though these implications may fall outside the scope of this investigation, a successful implementation of a microgrid at Aardehuis could further signify the niche's viability to a wider audience. This outer influence can be critical, but contemporarily Aardehuis still needs to overcome the problem that sub-question i) introduces: internal engagement.

Even though a great number of stakeholders look back at the development of Aardehuis as crucial in establishing their social bonds (Section 5.1.3.), some are very explicit about not wishing to undergo a process like Aardehuis again (I-7 & I-9). This leaves de Aardehuis at a crossroads, as a new project for the community to "sink its teeth into" could provide a boost to their internal engagement. A good approach to resolving this situation is by promoting a project within the community that has wide support. It comes to no surprise that some of the people interviewed see microgrids as a logical next step (Section 5.3.2.) that enriches the core values within Aardehuis. Some attribute their sympathetic outlook of microgrids to the insecurities of current grid capabilities (I-4 & I-9), while others are more interested in making the community more resilient (I-2 & I-10). These motivations align with the promises of microgrids as they relate to the integration of more sustainable forms of energy generation (Hernández et al., 2023), alleviation of centralized grids (Hirsch et al., 2018), and local energy reliability (Razanousky et al., 2010; Hirsch et al., 2018). In addition to a sympathetic outlook on microgrids, the inner stakeholders' motivations for joining Aardehuis overlap with Bushell's Green Living. which, in turn, supports the notion that Aardehuis' residents are more than willing to engage with drastic lifestyle changes, and have overcome significant resistances to establish their community (see Appendix A – Narratives in Climate Change).

6.2. Answering the main research question

"How can underlying narratives be leveraged to propose and develop a microgrid in the community of Aardehuis?"

Answer: In order to successfully propose and develop into a community microgrid, Aardehuis should consider the possibility of establishing and fostering a "champion" within their newest partnerships, take advantage of their pre-existing outlook on energy decentralization and current projects, and dedicate time to foster and strengthen their internal engagement.

Section 0.1. highlights several insights that stem from the strategic niche-narrative analysis: with the final recommendations this research advocates for revolving around the community's precedence and current attitudes. Aardehuis makes it clear that their cooperation with the municipality of Olst-Wijhe was sprung from one contact within the municipality and their subsequent support (Aardehuis, n.d.). This same strategy can be applied to their newest partnership with SERENE, the University of Twente, or Saxion University; facilitated by their pre-existing eagerness in welcoming people and institutions into their community. Tailoring the existing network towards the development of a community microgrid can also prove to be a popular decision within Aardehuis' own residents. All stakeholders interviewed hold microgrids in either a positive or friendly light, with even the municipality being actively concerned with finding solutions to the national grid issues of congestion and imbalance. Meanwhile, the residents see it as the next logical step that reinforces their underlying values and strengths as a community. However, the one overarching aspect within Aardehuis that can prove obstructive in implementing a microgrid is their internal dissatisfaction with current decision-making processes. Namely, veto power, and a sense of disinterest or fatigue post-construction. A community that relies on unanimous support, but faces growing disengagement within itself, is a community that will not be able to make drastic decisions within a timely manner. The implementation of a microgrid is a drastic decision reliant on cooperation of multiple stakeholders (inner and outer), and thus can be significantly hampered by the lack of engagement.

The identification of these recommendations, and the results provided by the research process, also begs the question of how to address them. The residents of Aardehuis could invest more time within the partnerships with SERENE, University of Twente, and Saxion University. Attributing more value to the "champion" within and actively strengthening that connection. This is especially necessary as the narratives found in Section 5.4. demonstrate a lack of awareness of experts involved, which are considered a crucial part of SNM's networking process (van de Poel, 2000). Intrinsic motivation must also be prioritized, as seen in sub-question i), and argued by Koirala et al (2016). One place that the literature can help with is regarding the perception of current structures. Most noticeably, the narrative seems to suggest that the inner rules that once facilitated Aardehuis are now working against them. This, in turn, can be addressed by revisiting this aspect of their structuring and realizing their own capabilities to change and adjust it (Stones, 2017). Furthermore, the building and maintenance of Aardehuis may have left some fatigued. Dobroć et al. (2023) argues that a deeper look into the social knowledge acquired from the endeavor, and the

interconnectivity present within Aardehuis' people and artefacts can work as a reminder of how much ground has been covered.

Technically speaking, a microgrid would require the installation of more solar panels, bringing with it the advantages of lower maintenance costs and frequency of subsidy schemes (Planas et al., 2015) that could provide extrinsic financial motivation. Aardehuis still implements 22 wood stoves for heating purposes (de Graaf, 2018) and their fuel source synergizes quite well with the implementation of a Micro CHP system (see Table 1). This suggestion is proposed by de Graaf as outlined in Section 2.1.1. These technical details demonstrate a baseline infrastructure that is compatible with that of Aardehuis in adopting a microgrid. Lastly, from a social perspective, an even higher amount of renewable energy generation could reinforce their motto of "Building, working and living in harmony with nature, in connection with each other and to inspire the world" (Aardehuis, n.d.). This strategic narrative (Bushell et al., 2017) for the community can serve as intrinsic motivation to pursue a new large-scale project, such as a community microgrid.

6.3. Limitations of this research

This research both benefits, and is limited by the community that it investigates, making the findings within Sections 5 and 0 context specific and not widely applicable. This is exacerbated by the fact that both the community studied, and the innovation proposed are two niches that have not seen ample implementation within the Netherlands. Consequently, both the framework and narrative accrue this context-specific characteristic. The strategic niche-narrative analysis framework is constructed to study a niche's acceptability of another niche innovation, making it useful for a scenario like the one presented above, but rather limiting when examining the numerous other methods of promoting the energy transition. In answering the research question, and sub-questions, this research identifies useful characteristics of Aardehuis' context, but does struggle in providing clear guidelines for addressing them. This limitation is inherent to the framework employed in this research. Consequently, Section 6.2. relies on the literature used for developing the framework to look for ways in which these recommendations can be acted upon. This is a key aspect that can be further developed within SNNA, as it would further improve the viability of the framework and the results it provides.

Sticking to the subject of the framework developed, the SNM processes tied to the relevant narrative analysis elements were first established from a logical basis and reinforced by the literature review. An argument can be made for the evaluation of ***Stakeholders*** regarding SNM's ***Learning*** process, ***Structures*** to ***Visioning***, or ***Stories*** to ***Networking***. Nonetheless, these exclusions come primarily from the researcher's consideration for what is more relevant to the aims of this thesis. This approach to the creation of SNNA led to challenges in terms of compartmentalizing the data gathered for the investigation and required a constant re-adjustment of the narrative elements and SNM processes compiled in Figure 3. This re-adjustment also led to fine-tuning the interview guide (found in Appendix B – Interview Guide). The amendment of – and subsequent email follow-up to– question 7 was needed as the responses provided by most interviewees struggled to focus on microgrids. These re-adjustments were further conducted in the

analysis of data, as the unedited interview transcripts proved challenging when it came to streamlining the information provided from them into the framework.

This difficulty can also be seen in the deviations from the main narrative present in Section 5.4., particularly regarding the positivity surrounding microgrids, the gravity of their current social cohesion and fatigue. The main deviation from the pre-existing support for microgrid infrastructure came from I-1, who argued "I am happy that we are not self-sufficient/ autonomous so that we can share." (I-1, Decentralization) which does not coincide with realized capabilities of a community microgrid (Ton & Smith, 2012) which can be seen as lack of information that needs addressing. Meanwhile, interviewees such as I-2 describe the current differences within residents as "just differences of opinions, and they are all not too much." (I-2, Inner), with a more commonly-held belief that the community still has a lot of solidarity. The fatigue post-construction is also somewhat challenged by I-5, one of the newest residents of Aardehuis (see Table 2) by stating "If we needed them, they were there without question." (I-5, Inner) in regards to their home's extensive renovations. Overall, these deviations demonstrate the innate complexity of attempting to synthesize one coherent narrative, and how the one made by this research is unable to encapsulate all sentiments.

Lastly, the narrative and subsequent distilments from it are based on the input of ten stakeholders, eight of whom are full-time residents, one who has consulted in similar projects, and one who is part of the municipality. Therefore, expanding upon the interview pool and adding stakeholders from SERENE and Enexis, the local grid operator, could only strengthen the findings of future research.

7. Conclusion

De Aardehuis offers researchers a unique opportunity to observe how a niche develops and adapts to the challenges brought on by infrastructure, climate change, and time. With this investigation studying this community to answer the following question: *"How can underlying narratives be leveraged to propose and develop a microgrid in the community of Aardehuis?"*

This thesis can conclude that de Aardehuis must take advantage of its current networks, projects, and positive outlooks on further improving its self-sufficiency to propose and develop a community microgrid. However, to successfully implement such a project, Aardehuis should revisit its sociocracy and address some underlying concerns its residents speak about. The efforts from this investigation identify a narrative within this community that can substantiate these recommendations, while also recognizing the impossibility of representing all sentiments provided by those interviewed and the limited data from ten interviews.

The methods employed to improve internal engagement are also subject to further investigation, as this thesis performs an evaluation of the status quo of Aardehuis' narratives but is unable to provide a clear guideline into addressing the issues identified. Consequently, further investigations into the community could also benefit from focusing entirely on their decision-making process and its application during the construction phase of Aardehuis. Nevertheless, this thesis further adds to the field of energy transition and radical niche innovations and provides a framework that focuses on developing new ideas within established niches. Taking advantage of the current developments at Aardehuis, this thesis arrives just as the community begins to dabble in energy decentralization and offers a possible end-goal in this regard. The study of community living, and how narratives can be applied herein is a growing field that, as this researcher suspects, will gain popularity as more initiatives akin to Aardehuis continue sprouting.

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9. Appendix

Appendix A – Narratives in Climate Change

An overview of narratives regarding climate change action (Bushell et al., 2017)

Narrative	Synopsis	(In)Effectiveness and Reasons
"Gore"	Named after the film "An Inconvenient Truth" that follows the former vice-president of the United States: Albert Arnold Gore Jr. "Gore" entails a narrative of scientific discovery which focuses on the certainty that climate change is unequivocally caused by humans. Tailored to overcome any ambiguity regarding the cause of climate change, to clearly establish that science is "finished" debating the facts, and that only changing human behavior will address this issue.	Knowledge plays a vital role in comprehending climate change, however, the narrative over-emphasizes definitive scientific solutions which opens the narrative to scientific criticisms. Furthermore, the narrative fails to acknowledge that facts alone do not motivate or stimulate appropriate behavior.
Alarmism	As the name suggests, this narrative emphasizes past and present human (in)action that risks a catastrophic future event unless radical change takes place to mitigate it. Proponents of this narrative advocate for wartime-like mobilization of industry and society as the only means to combat climate change.	Alarmins, in general, has proven to be highly effective in drawing attention to a problem, but ineffective in creating urgency, often-times creates the polar-opposite effect of disengaging audiences through overwhelming hopelessness.
Breakdown of Complexity	This narrative focuses on individual stories of personal responsibility and solidarity. Acknowledging that climate change requires an incomprehensible number of actors, "every little bit helps" tries to demonstrate the importance of individual actions. This narrative draws attention to the concept of "Tragedy of the Commons" and the individual acts carried out therein.	The breakdown of complexity creates a disparity between individual action and real change. Even though it can help individuals realize how their actions impact climate change, this narrative's messengers (politicians, scientists) often lack public trust, especially when these same entities do not adopt the narrative they preach.
Distancing	The main narrative revolves around non-humans, polar bears and the melting of ice caps has often been used as imagery of the consequences of climate change. The main argument of this narrative is the systematic destruction of other creature's habitats as a direct consequence of humanity's actions.	This narrative suffers from the over-use of imagery that creates cynicism and fatigue among audiences. Despite its iconic imagery, both polar bears and the icecaps are physically distant from most people. Combining this with people's immediate day-to-day issues, and both temporal and spatial distancing manifests.
Green Living	This narrative offers a vision of drastic lifestyle changes in the name of the common good. Focusing on "sustainable living", a green life is one that involves sacrificing comforts of moder-day societies that directly or indirectly harm the environment. This narrative also banks on the fact that patterns in energy consumption tend to be determined by social norms.	As expected, any narrative that advocates drastic changes in lifestyle will be met by resistance. This becomes especially hard to realize if the changes go against values, belief systems or implicit rules within communities.
Debate and Scam	A narrative that opposes climate change action by relying on the argument that the scientific debate on climate change is still open. The existence of multiple ways to solve climate change can further solidify this narrative, and the media's attempts of providing "balanced" coverage on climate change has, invertedly, over-represented the arguments against anthropocentric climate change.	This narrative proves quite effective in excusing the cognitive dissonance audiences may feel regarding climate change. Furthermore, the previous narratives' struggles with de-abstracting climate change action creates apathy amongst audiences that this narrative is more-than-willing to leverage.
Carbon-Fueled Expansion	This narrative puts the economy as the "protagonist". While not denying anthropocentric climate change, this narrative argues that mitigation efforts are economically unfeasible and hinder growth. "Carbon-fueled expansion" sees any possible renewable solution as agents that slow down the economy or increases prices for consumers.	A particularly effective narrative within Western nations, this narrative relies on the precedence of markets solving socio-economic issues. Furthermore, the focus on economic well-being resonates with individuals as one of, if not the most, pressing concern they face daily.

Appendix B – Interview Guide

The following guide, alongside a brief of the research's end-goal, credentials, and details was shared with all participants during the interview process, prior to the interview itself, and during.

Introduction

1. *"Could you describe your connection to de Aardehuis?"*

Visioning

2. *"Let us go back to when you first learned about de Aardehuis. What were your expectations regarding it?"*
3. *"How does de Aardehuis compare to these projects that have similar goals?"*
4. *"What do you think differentiates de Aardehuis from what the country has done to fight climate change?"*

Networking

5. *"Who works, or has worked, with de Aardehuis?"*
6. *"What, in your opinion, is de Aardehuis' main message, or perhaps objective, that drew people to help?"*
7. *"Do you think that de Aardehuis could benefit from being entirely self-sufficient in terms of energy? Why?"*

Learning

8. *"What are some of the challenges that you (or de Aardehuis) have encountered?"*
9. *"How has your perception of de Aardehuis changed from when you first learned about it to now?*
10. *"Have you noticed any changes in your personal opinions regarding this way of addressing climate change?"*

Appendix C – Interview Codebook

Element	Code	Description
Stakeholder	Outer	Respondent acknowledges the involvement of organizations/individuals from outside de Aardehuis. Focused primarily on the interactions present between the community and groups/institutions/organizations that are interested in it or were involved in its creation.
	Inner	Respondent acknowledges the involvement of organizations/individuals from within de Aardehuis that either contribute to current living conditions of its residents or helped during its creation. These include both formal and informal groups/institutions.
	Expectations	Respondent speaks to their expectations surrounding de Aardehuis' development and living conditions. These encompass both individual expectations, as well as the expectations of others.
Structures	Rules	Respondents speak to the formal structures in-place that affected the creation and continuation efforts of de Aardehuis in both beneficial and detrimental ways.
	Cultural Norms	Respondents acknowledge specific behaviors/attitudes/ideological believes that are held in relation to de Aardehuis or the wider landscape of the Netherlands.
	Resources	Respondents talk about the different resources necessary for the creation/maintenance of de Aardehuis in either abstract or concrete manner.
Stories	Experiences	Respondent reflects on their time in collaboration with de Aardehuis, highlighting advice or key takeaways that speak to their experience.
	Decentralization	Respondents allude to, or directly posit their perspective about Decentralization and what that means for themselves and the community. Including references to actions taken towards decentralization.
	Contextuality	Respondents alludes to, or directly relates their opinions and perspectives on climate action to one of the seven narratives in climate change discussed by Bushell et al. (2017).

Appendix D – Coded Interviews

Interview #1

Element	Code	Excerpts from Transcript
Stakeholder	Outer	You see lots of energy corporations that are picking up the local energy question and trying to have assets like solar-module parks and locally connected windmills and owned by local people. There is now, in the Dutch government, the energy law that is coming up. They have the idea to put energy sharing as a rule. Most of them [residents] have a green energy supplier. For me its OM, it's like a non-profit energy supplier. Different enterprises [material sourcing]. The idea was to use it as locally as possible. At the start we had an advisor. Its called Building Community. The woman of the municipality [of Olst] said "wow, this is quite a nice idea that you have. Maybe, our municipality is into this." A small municipality you can directly contact the people who can decide, and they became enthusiastic of our ideas. Which was a very nice way of doing it, otherwise this would not be realized, if you do not have a flexible municipality. With this European project running, we have a big battery system in the carpark now to start up the idea of being more self-sufficient.
	Inner	I see this really like we are forerunners, and you see the moment that we started it, the idea of local energy, to be self-sustainable. It's good to do it ourselves [related to energy]. Collective Private Commissioning. Individuals that get together and decide to build together. This was the idea for building this neighborhood. Looking at the materials, for instance, we got a special group of people thinking about "where we are gonna get our material?". We had a special group of people going into this, looking at the market for land.
	Expectations	Not so many expectations, lots of enthusiasm. You see very beautiful houses and self-sustaining. It's a very natural outlook they have. It's very green, and they have living in the soil- the ground- because you are surrounded by it. We had the idea that the environment here is for everybody and we have to sustain it also by everybody. I had not very much clear ideas about how it will go living here. My idea was that I wanted to change the world, I want to give an example that is able to be copied by the rest of the Netherlands.
Structures	Rules	They already had bought a piece of land, of 1.3 hectares, there they already had the permit to build Earthships. The normal way of building is like, very strict rules no round forms, and also bricks and concrete. I do not see any rules or governmental instructions if new buildings are made, that it should be- not normal way- but the low CO2 footprint. It's good to do it ourselves, and the rules also need to accommodate this. We all have our individual connections to the meters. Collective Private Commissioning. Individuals that get together and decide to build together. This was the idea for building this neighborhood. For us, however, its completely unimportant [in reference to where one house starts and the other ends].
	Cultural Norms	I was already into environmental building with other resources. It's a very natural outlook they have. It's very green, and they have living in the soil- the ground- because you are surrounded by it. I think we are so busy with the climate problem, and the material has a very big influence on how bad or good you are, your CO2 footprint. Making local energy for local people and giving them their own responsibility to them. Also, as a way of making money, but it should be non-profit. We decided that we build "collective", we build our own. We want to have our own houses, that's the private part, and then this "entrepreneurship" because you must act like an enterprise. If you look outside here, and walk around, there are no fences in this neighborhood. These houses, even when they are big and unique, they are cheaper compared to new houses and their ways of building.

Stories	Resources	They already had bought a piece of land, of 1.3 hectares, there they already had the permit to build Earthships. Making local energy for local people and giving them their own responsibility to them. Also, as a way of making money, but it should be non-profit. We had 6.5 million euros, if you look at the total amount that it cost. You must bring the money together to do this, you must be an enterprise. They [municipality of Deventer] said "yeah well, nice ideas but we have no room for this". This was at a time when the grounds were very scarce. This municipality [of Olst-Wijhe] said "Well, we have some area where we want to do maybe your project." That takes a lot of time to build and makes them more expensive. I would build more modularly, same forms every time and with a simple form. We are all people with vision but also with wallet. We pay very few costs for our infrastructure. If battery prices, etc. are going in a good way then we have this mayorly cost. We have more batteries, and in the end, we will be totally self-sufficient. To be independent would make our community less vulnerable for (potential) external energy shortages, high prices, etc. Also by sharing [energy], there is a chance to have some financial benefit.
	Experiences	I think we are so busy with the climate problem, and the material has a very big influence on how bad or good you are, your CO_2 footprint. I see very few projects taking up this problem [large CO_2 footprint]. How can we live in a social way? Which brings both good and bad things. What I learned from this, if you ever look at smaller municipalities, with a direct connection to the people. We have been living here since 2013, so eleven years. I am happy with it. Its not perfect, but it fits into the feeling I had. I would build a smaller house (...) This house has many forms, which makes it difficult to build. All houses are different, they have their own form. Because of this, we should have a connection with the outside world, we have a surplus of energy which is pretty good.
	Decentralization	For me, vision-like, that was a very good thing. Be self-sustainable. We want to be totally sustainable, we do it with our water. And we wanted to do this with electricity also, but this was not allowed. In the beginning we also had the idea of being totally self-sufficient, which means no connection with the grid. In the winter, that would cause a problem. Because we have our own water system, electricity system; we have a surplus of electricity on a yearly base. Of course, we would build our own grid, in this neighborhood. Having the connection like Schoonschip, in Amsterdam. With this European project running, we have a big battery system in the car-park now to start up the idea of being more self-sufficient. We have to find out how it works, but my first calculations are that we could be self-sufficient for about half a year. That was also one of the main drivers for this project. To be as self-sufficient as possible. if energy self-sufficiency means the same as energy-autonomy. Yes, because the benefit would be that we would not rely on external parties (energy-suppliers) anymore. I am happy that we are not self-sufficient/ autonomous so that we can share.
	Contextuality	It's a very natural way of living. It's beautiful, with all the green around. For me, that was the biggest trigger to do the Earthship way of building. "Building and living together, in a very sustainable way. Which means in energy- material- and social-wise." Naturally want to live like a population of 150. Were you can have your neighbors looking after your children, you know the whole group of people, more or less. "Okay, I want to live here with people in an environmental way, in a very green area." If you really want to change the world, and this is what many people here have, then we should be an example. We actually have a surplus of energy on a year base, so it is nice to share this with surrounding neighborhoods.

Interview #2

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	We had a camping ground here that was allowed by the municipality. I know that we got and get a lot of support from Olst, they have a "parade horse" to be like "Look at us!", so they got a lot of attention. Olst gave us permission to change the former plans that required those parts to be green. Of course they [the municipality] have rules also, we have stay within the rules, but they work with us not against us. Collective knowledge grows and we can share that with the outer world.
	Inner	He went to this evening, about Aardehuizen because somebody tipped him. People came and said "yes" and well, a group started and at that point. It also involved a lot of stress in making decisions and having meetings together, and people get mad and emotional. We got interviewed because there was this need to know if you can build one day a week, and can you fit in with the community. Who are you? What can you do? Everything started with doing everything together, making the decision together, working with everybody. We don't eat together, we don't work together. It's all voluntary (...) The same with working together, we do the greens together, and if you don't want to do it, then there is no problem. What I think that this is good for nature, and my neighbor says that this other thing is good for nature (...) Its just differences of opinions, and they are all not too much.
	Expectations	I never had a longing for community-living, I never had a longing for living other than in a house with water from the companies and, you know, a standard house. I was like "wow! Im gonna build my own house… let's do it!" (…) I thought it was really romantic that we used these kinds of materials. Seeing myself with a straw hat on, working in the sun with my kid playing nearby in a bale of hay. I saw a film about community building and making it that way. It wasn't as light as I expected it to be.
Structures	Rules	We got interviewed because there was this need to know if you can build one day a week, and can you fit in with the community. Who are you? What can you do? When we were building, there was obligations. You had to make your hours, and somebody was noticing if you did or didn't collaborate. Of course they [the municipality] have rules also, we have stay within the rules, but they work with us not against us. Also not supporting any ' not so nice' practices by the energy companies. It also involved a lot of stress in making decisions and having meetings together, and people get mad and emotional.
	Cultural Norms	We don't eat together, we don't work together. It's all voluntary (...) The same with working together, we do the greens together, and if you don't want to do it, then there is no problem. You can connect whenever you want, and that is the difference between being in a block of house in a normal neighborhood, you can't connect as easily. Sometimes I might ask for money if its expensive, but we also trade things between us instead. What I think that this is good for nature, and my neighbor says that this other thing is good for nature. Living with each other is also very natural because we need people around us.
	Resources	We were doing it all, so I can't tell for this house. But say 1.5 years doing everything… 2 years maybe. I cut down branches from trees because I wanna use them for something, some may do it for profit. We have solar panels for electricity so we can be independent if we wanted. Also not supporting any ' not so nice' practises by the energy companies.

Stories	Experiences	It fits so well; it happens in my life. You kinda surrender to it. Building was really hard, a lot of stress. What I distil from that is that to know your neighbors beforehand. It also involved a lot of stress in making decisions and having meetings together, and people get mad and emotional. Most of the other communities work more together, organize evenings like yoga or meditations together. If you want to contact it's there, if you want privacy it's there (...) I have both worlds, which I really like. I don't go out crying "You have to do this!", the "you" being the politician or my neighbors or going protesting. I think it's really comfortable, and this is the most comfortable place that I have ever lived because its more "me". I wasn't interested in sustainability. I didn't even know the word, and of course now I am very interested in how other communities do this.
	Decentralization	[Before joining Aardehuis] We started composting, we started collecting our shower water to rinse the toilets. We have solar panels for electricity so we can be independent if we wanted. Being not dependent on the changes in the system and movement in the rules of the energy suppliers. We can possibly continue living the way we are used to do even when something happens in the world. And with that we can possibly help others in the area.
	Contextuality	We were living at this "anti-squatting" somewhere in the middle of nowhere and my husband said "I want to do things differently". Being a nomad. I like that. I started using organic foods at the same that we started getting interested in this (Aardehuis). Seeing myself with a straw hat on, working in the sun with my kid playing nearby in a bale of hay. I saw a film about community building and making it that way. That makes that I am not polluting, and that goes so far and its like a ripple effect. I am here, and I have to do it here, and I make the best out of it. Living in harmony with nature is also a personalized thing. I wasn't interested in sustainability. I didn't even know the word, and of course now I am very interested in how other communities do this.

Interview #3

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	We had a guy in the municipality that who wanted this to work, so he was on our side (...) If you don't have a guy in the municipality to help you it's difficult. We got a lot of resistance, but after we finished we got a lot of appreciation from the municipality. I think there were no other organizations that were involved in that process. All the experience they got from de Aardehuis they put into Schoonschip; I think so.
	Inner	I was volunteering here they started building I said "okay, I will stick around for a few months, and I know how to do it and can do it myself". There were a few people who created the initiative. The group of inhabitants, the people who wanted to live here, somewhere around 60 people (...) They are very committed, like it was said "bottom-up", they did everything. The people who live here, they are really eager to make this work because of the money and because they want to show the world that it is working. After the house was built, people wanted to have more of a "this is my house, and I have to stay in it, and we don't do it all together".
	Expectations	New neighbors and a new environment, new house, everything new. Start fresh. I don't expect the whole of the Netherlands to live like this.
Structures	Rules	We had a process of interviewing to see if you fit the program. That is what I learned, when there are too many differences it won't work. Most people think that it's not possible because we have a lot of regulations (…) every new house back in the day needed to have infrastructure for gas. Now it's the law, you don't need gas ovens or gas pipes anymore. It takes some time to change. There are so many rules, and there is so many interested people and ways to make profit. Don't do the social system we have in which everyone has to agree on a decision, or it doesn't go through.
	Cultural Norms	The Aardehuizen are the forerunners in the Netherlands, we are the first ones to do it this way. You need like-minded people. We have a lot of experiments here, a lot of new things. We can try and we can do this, it's not mainstream yet. The old way of building makes it very efficient and very profitable but it's not solving the problems we are facing. We started our own Homeowners Association as a collective, and everyone started to quit. Now the center house is the only one part of it, and every other house is on their own in that regard. Like-minded people and democracy is important, but don't aim for 100% because you get all kinds of social resistance.
	Resources	In the beginning they said it was 3 to 6 months before everyone knows how to build a house, and most houses took more than a year (…) We started building in 2012, and it all finished around 2016. it was their own money, I think that was one of the reason why most projects don't succeed because they have no money at all. There are so many rules, and there is so many interested people and ways to make profit. This won't make profit.
Stories	Experiences	I was in the group of safety, and we are building with volunteers which are not professionals, inexperienced (…) The safety was a problem (...) have more professionals and less volunteers. Because they are a risk for the continuity and the safety. When you are building the house, you are together. When the houses are ready, there is no need to be together anymore, and everybody goes their own way.
	Decentralization	I was into sustainable all my life and this is a great example of having a sustainable future and house. In my opinion it's all about sustainable living and self-supporting houses. Living with nature, you know, you can do it anywhere. [In Interview VIII, this respondent is named as initializing the solar panel + battery storage system in the carport]
	Contextuality	I was into sustainable all my life and this is a great example of having a sustainable future and house. The old way of building makes it very efficient and very profitable but it's not solving the problems we are facing. Its more urgent. I thought it was only funny to be sustainable, and now this is the way to save the world.

Interview #4

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	The country mostly asks for more dense, efficient construction. In de Aardehuizen, it was mostly people plus some architects and some outside experts. Schoonschip, they had contractors for the houses, they were more like project developers and construction workers. Everything was so new, everything with the municipality went very slow. Having a "champion" within the municipality really helps.
	Inner	When he started building it, I was still studying and I had a half-year gap in my studies and decided to help and build for that time. Both Aardehuis and Schoonschip are clearly more communities, they are bottom-up projects with a bunch of people that come together. That [bottom-up initiatives] also comes with very sloppy and chaotic decision-making process.
	Expectations	I was like "let's see if this actually happens", it wasn't a given that it was going to be successful. It wasn't an expectation that it would fail, but there was a risk element when it started. It was mostly curiosity in how it would play-out.
Structures	Rules	They can act as the project developer and the architect for the project, which is called CPO in the Netherlands (CPC in English). That [bottom-up initiatives] also comes with very sloppy and chaotic decision-making process. It's quite difficult to have projects like de Aardehuis in the Netherlands because of lack of space and also because there is also regulation that limits the price of houses.
	Cultural Norms	Both Aardehuis and Schoonschip are clearly more communities, they are bottom-up projects with a bunch of people that come together. All CPO projects are bottom-up, and they are generally the ones full of character. If you get too many amateurs with too heavy-weighting opinions, then it's going to create conflict.
	Resources	Depends very much on the people that started it, how much money they have. Netherlands we have a shortage of housing, a housing crisis. Aardehuis is pretty unique but it's not going to solve the housing crisis. Flexibility is very much needed because the grid is congested, and we have the most solar panels per square meter in the world, but we are almost full now. My dad's energy bills are almost zero here, compared to old houses that can go upwards of 1000 a month.
Stories	Experiences	In general, top-down projects are more effective, efficient and in general more cost-effective. The community ones are more special, more human because the people who built it are gonna live there themselves. The municipality [of Amsterdam] were (for Schoonschip) medium-cooperative. The more new stuff you try to do, the more resistance you can expect from the municipality. Don't try to re-invent the wheel and that means working with experts. Some stuff you just need to leave to the experts.
	Decentralization	Aardehuis is one of the few energy-positive neighborhoods in the Netherlands, it produces more than it consumes. You can limit the peak-power and output to the grid. These type of neighborhoods are an important pillar of the energy transition to have more system integration on a neighborhood level (...) you can integrate heat-pumps, electric vehicles, hot-water storage, solar panels, batteries. You can integrate locally and thereby unlock a lot of flexibility for the power grid. Flexibility is very much needed because the grid is congested, and we have the most solar panels per square meter in the world, but we are almost full now. I do feel like living in self-sufficient neighborhoods is like one of the few very possible and achievable and reasonable things we can do
	Contextuality	They [Aardehuis & Schoonschip] definitely show that it's possible to get a bunch of people together to build something unique and interesting. Both projects have had a lot of exposure, they are all lighthouse projects. I think that my opinion of the future is pretty grim. The people that had the impressions like my dad to change lifestyles, they won't be the losers.

Interview #5

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	We basically looked that up on the Dutch Housing website and stumbled upon an ad for this house that was for sale. They made some construction errors when they were first building it and that's why the Living Corporation [SallandWoren] wanted to get rid of it [sell the houses they owned] because these were the only three houses that were for rent. Several of my neighbors are in Extinction Rebellion, or have founded it. I know there's a couple of neighbors who are in political parties very, very left-wing political parties. The Netherlands as a whole has a lot of catching up to do. Whether it's someone you know personally or volunteer you know.
	Inner	There's a lot of solidarity in the Aardehuis like and you never feel like you're alone. Here's a group of people who have the guts to go about and do things completely differently in a very small village. There's more privacy here. Well, you're still half the community feeling because everyone does have their own home. They have more unity when it comes to the way they've been built. It's still the older generations that have to funds. I think a lot of the people living at the Aardehuis are actively voicing their concern and you know, participating in protests or being in the organization of the protests. Almost every single one of the people living at the are the house is concerned about the climate is concerned about the way things are going, and it's even more concerned about the latest elections. They've already done 30 years of fighting where we're just coming in and green like, yeah, but we need something so much more. We felt a little bit of a rift in the beginning because we were not there while building and they've been through a lot together and the building process and you can feel that they've, they've forged bonds. When we asked for help, people showed up and we hardly knew them and they climbed up on top of our roof and they helped for days on end. We hadn't really gotten to know anyone very well, and still they helped and they carried heavy beams. If we needed them, they were there without question.
	Expectations	We both really wanted to live in a community because we feel that moving forward in the future, it's gonna become more and more important that we do things together. You can build on each other and we find that very important and in the big cities we lived in, we have that feeling a lot less. My boyfriend has been following that Aardehuis project from… well, basically its inception. The people that that were living there had to be a lot more aware than the people living in cramped little apartments in the city just going about their day-to-day life. I would feel a lot more at home there myself and more understood and what is less the odd one out and that I would be able to grow as a person in the Community because of the people who were living there. I wanted to learn a lot more about the way they have been building because we of course we came in a lot later in the project and the houses had already been built. We did not necessarily expect [older neighbors] when we moved in, but we only met a few people. I did it for a dream house and for a way of living for. Reconciling those two took a while. What we expected was the Community life and being able to count on one another.
Structures	Rules	They have more unity when it comes to the way they've been built. That's kind of the only reason we were able to buy the house at all because we're both entrepreneurs. We were never gonna get a loan. Almost every single one of the people living at the are the house is concerned about the climate is concerned about the way things are going, and it's even more concerned about the latest elections. The Netherlands as a whole has a lot of catching up to do. But we have as a collective a very long way to go. I think we're taking good steps, yes, but we're not there yet. And that goes for it, for our government as well. And that goes for new legislation as well.

	Cultural Norms	We have been looking around for a place to live that did things differently for a while. There's a lot of solidarity in the Aardehuis like and you never feel like you're alone. You can build on each other and we find that very important and in the big cities we lived in, we have that feeling a lot less. We want to live somewhere where the people who have a similar mindset, so they value nature, they valued the climate, they value fighting for embattled world. But we have as a collective a very long way to go. I think we're taking good steps, yes, but we're not there yet. And that goes for it, for our government as well. And that goes for new legislation as well. We want to surround ourselves with people who find personal development important. We stand by and in a community with like-minded people. It comes with all the whole shift in mindset as well. Breaking loose. From societal expectations and about the way the things that always have been done. They've already done 30 years of fighting where we're just coming in and green like, yeah, but we need something so much more. Living in harmony with nature on people, it's part of their slogan. They made us feel at home right away that that was never an issue, but it took us a while to actually feel part of what they had built. After we finished [working on the roof] there were like, alright, well, you're really part of the community now.
	Resources	Quickly realized that most of the projects were not in the South Holland. We basically looked that up on the Dutch Housing website and stumbled upon an ad for this house that was for sale. It ended up being way too expensive and we got lucky because I already had an apartment that we could sell. That's kind of the only reason we were able to buy the house at all because we're both entrepreneurs. We were never gonna get a loan. It's still the older generations that have the funds. I think they put quite some funding into the houses as well at the beginning.
Stories	Experiences	There's a lot of solidarity in the Aardehuis like and you never feel like you're alone. You can build on each other and we find that very important and in the big cities we lived in, we have that feeling a lot less. We had to do a lot of renovating. We're still doing a lot of renovating. I would feel a lot more at home there myself and more understood and what is less the odd one out and that I would be able to grow as a person in the Community because of the people who were living there. It's still the older generations that have to funds. We felt a little bit of a rift in the beginning because we were not there while building and they've been through a lot together and the building process and you can feel that they've, they've forged bonds. Surround yourself with people who are actively doing something about it [climate change]. I think it was easier to take a stand for those choices [pro-sustainability] when we moved in with the Community who does the same. I think what's what for me is also important to highlight is that living in a space like this is so much better for your mental health. You give their lives and yours meaning as well by building something like this together.
	Decentralization	The idea is to serve as an example for those who have already created more awareness and for those who have already decided to do things more differently and who are interested in learning how. Living in harmony with nature on people, it's part of their slogan. At every single turn we've been able to count on our neighbors. I've gotten more self-assured in saying no to the things that don't align with my view.
	Contextuality	We both really wanted to live in a community because we feel that moving forward in the future, it's gonna become more and more important that we do things together. OK, we want to live in a community. We want to live somewhere where the people who have a similar mindset, so they value nature, they valued the climate, they value fighting for embattled world. We knew we wanted it this this was our dream house. It was built on principles. What I thought it looked like the Shire from Lord of the Rings. There's a lot of people living in Netherlands who want to live differently. If enough of us keep promoting this kind of lifestyle, set way of living, making different choices, offer single day. I did it for a dream house and for a way of living for. Reconciling those two took a while. I think it opened my eyes even more and more that I was still living in some of those lies myself. I think what's what for me is also important to highlight is that living in a space like this is so much better for your mental health.

Interview #6

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	Nowadays I'm part of the very small team taking care of external communications with the you want mainly the media. We wanted a municipality to be a partner instead of just. Well, the receiving end of an of a building application. I'm right now I'm one of the board members of the Global Ecovillage network and the Dutch branch of it. If you look at the numbers of people turning up at. Guided tours we have, we are still, obviously, an inspirational place to visit. Not only individuals but also building companies or architects. Sometimes there are just new journalists from the same medium that come to us. Partly depending on the attitude of the municipality. That's an important stakeholder. It was built gradually with the municipality, that grew into a very good companionship. Broader audience in terms of the type of solutions we promote for creating a more sustainable society. There's new ones being attracted by our presence and that now are advocates of the same story. Olst National Symposium for politicians and civil servants of municipalities and provinces. People who were enthusiastic about that specific type of building, they were literally drawn to us. There was actually a group of worship fans that that kind of wanted to promote the whole idea of ships in the Netherlands at that time. There was also an ownership fan club in in Belgium. They [an initiative focused on multiple projects in the Netherlands] didn't feel like a very solid and focused group. After we've finalized building, I had initiated, in 2015, a transition initiative called "Olst in Transition". Which spawned quite a lot of Initiatives of their own like a corporation for a green energy which is now powering 2000 homes in the neighboring village. There's also a sustainability fund being funded by the revenues of that Solar Park.
	Inner	I'm the initiator so. In the in the first couple of years, I was the Chair of the association. Nowadays I'm part of the very small team taking care of external communications with the you want mainly the media. I put out an invitation for people to attend. Well, watch my little slideshow. And instead of 10, 40 people turned up. They didn't all come from Deventer, also from Amsterdam and well, you name it. We started to maintain all the communal assets like the greenery and the Community House and the paths and the water treatment et cetera. One of the one of our Members, got in touch with, with and one of the alderman of the municipality of Olst. We attracted a specific type of people who want who are very much into sustainability but and also very much into doing it themselves. There was a type of focus that helped us to create something tangible. This focus on this one municipality because that really made our whole idea so much more focused and attractive also to people looking for that specific initiative. The social meetings we had afterwards in in the recent phase, some people just don't turn up anymore. We were not so much into creating a community from the start on so and repairing that afterwards is a harder thing. I joined Extinction Rebellion. For me the next level and necessity to get change and to act, that's also being joined by about 10 of my direct neighbors here at the Aardehuis. Some of my other neighbors and think like oh well, that's kind of sympathetic [joining Extinction Rebellion], but I wouldn't join them and some and a few of them think like oh you shouldn't do be doing that it's wrong. We are not, as a community, outspoken in a very clear sense about how to approach the climate crisis in in general.
	Expectations	Just the single house, you know, for us. We wanted a municipality to be a partner instead of just. Well, the receiving end of an of a building application. I wasn't aware at all about what? What building a house cost in the Netherlands. My expectations were that you could probably build other ship for, say, €50,000 Max. Umm but that that appeared to be a kind of a delusion later on. I'm learning how to build my own house. One of the main issues that that got me hooked in the 1st place. Building your own eco home with lots of natural materials. Because we created this project with the very clear statement that we were going to build it ourselves. Focusing on you may say kind of a practical level. We were working in this self-chosen niche. Are we doing something wrong? (Trepidation).

		That's a that's kind of a disappointing aspect. Other eco-communities sometimes have a better approach in that [community-upkeep] because from the start on they invest very much into.
Structures	Rules	There's a focus on inclusive decision making, and conflict resolution. We started to maintain all the communal assets like the greenery and the Community House and the paths and the water treatment et cetera. sluggish the whole process in Deventer and they had they just had an A real reorganization of the whole civil servant's apparatus. The whole type of building is, experimental to Dutch standards. That's quite a different approach [Olst's eagerness], that was why we moved our focus to this municipality and ended up here. We were very much ahead of the building regulations, you might say. I'm right now I'm one of the board members of the Global Ecovillage network and the Dutch branch of it. There's a focus on inclusive decision making, and conflict resolution. presentation for them and the alderman of the Dutch Green Party, who was part of the local government. Sooner or later, the Dutch power grid is going to fail, with blackouts and whatnot. Right now, the flexibility of the system is already being severely tested due to tightness in the grid.
	Cultural Norms	Later on, luckily, I could take some steps back and just be what part of part of the Community. Instead of being a kind of the person who people listen to and think of. This may list of some 70 people who wanted to know how the Earthship project near Deventer would continue. The whole type of building is, experimental to Dutch standards OK well this this looks like kind of a community effort to on, on the rise, what shall we do. And so we decided to announce monthly and I kind of visioning. What would it be like to have built your own house and know every inch of it. I think because we built ourselves everything, we are kind of in a still a community with a very practical. Extended living room for the for the resident and a month of multi-functional. Representative room for receiving people from elsewhere. We have we have a variety of do it yourself solutions. From the very beginning and as far as I know I it's about 13,000 people showing up. Nowadays there are many more eco-villages and eco-communities on the rise in the Netherlands. They gradually discovered that the residents were also in a very important impulse for on the on the cultural and societal level for the for the wider community of Olst. We were working in this self-chosen niche. Are we doing something wrong? (Trepidation). We actually had an advantage for ourselves by having this specific focus. You are never finished building in terms of the social aspects, you are a bunch of people who are at least strong headed and focused, and that didn't change. Even turned kind of allergic to having to discuss everything with everyone because you have to make a communal decision and stuff like that. We were not so much into creating a community from the start on so and repairing that afterwards is a harder thing. We are not, as a community, outspoken in a very clear sense about how to approach the climate crisis in in general.
	Resources	You could probably build other ship for, say, €50,000 Max. Umm but that that that appeared to be a kind of a delusion later on. One of the main issues that that got me hooked in the 1st place. Building your own eco home with lots of natural materials. We created all kinds of low tech solutions for things that are well for instance the roofing, We don't have much accommodation for economic activities that can help our community. After we've finalized building, I had initiated, in 2015, a transition initiative called "Olst in Transition". Which spawned quite a lot of Initiatives of their own like a corporation for a green energy which is now powering 2000 homes in the neighboring village. There's also a sustainability fund being funded by the revenues of that Solar Park. You could argue that our dependence on nationally or even internationally controlled central systems makes us vulnerable. Sooner or later, the Dutch power grid is going to fail, with blackouts and whatnot. Right now, the flexibility of the system is already being severely tested due to tightness in the grid. The availability of building ground and know how expensive that is, the need for and stamps and documents of experts you have to hire.

Stories	Experiences	I got the opportunity to go and to go to Sweden and build and to help build an Earthship there.
		We were focused on Deventer because that's where most people came from. But that's turned out a deception.
		We are the standards of energy consumption and energy (...) insulation, they're still very much comparable to the nowadays standards.
		From the very beginning and as far as I know I it's about 13,000 people showing up.
		It was built gradually with the municipality, that grew into a very good companionship.
		There was a type of focus that helped us to create something tangible.
		That was a period [building de Aardehuizen] in which we were, very close. Very empowering and in social terms binding and bonding.
		Seeing things grow by your own labor, seeing a dream of a thing getting into reality.
		Some people were kind of exhausted from the whole building phase.
	Decentralization	We have this system of working groups that do the work and kind of our self-steering.
		Just the single house, you know, for us.
		One of the main issues that that got me hooked in the 1st place. Building your own eco home with lots of natural materials.
		It's an intentional community, not something that's kind of happens.
		I think because we built ourselves everything, we are kind of in a still a community with a very practical.
		We are the standards of energy consumption and energy.
		We have we have a variety of do it yourself solutions
		insulation, they're still very much comparable to the nowadays standards
		we are more down to Earth community, you might say in in the sense of umm uh. Well, just umm and yeah.
		Because we created this project with the very clear statement that we were going to build it ourselves.
		We attracted a specific type of people who want who are very much into sustainability but and also very much into doing it themselves.
		The continuation is, and maybe that's just a typical for a communities like these… They are kind of self-sustaining.
		We are an intentional community that is looking for partners in order to establish self-sustaining building.
		Self-sufficient energy generation is a logical next step. A finely meshed network of generation and storage at district and neighborhood level would make us a lot more resilient as a society.
	Contextuality	You [interviewee referring to themselves] should look at the website I recently saw called Earthship.com or.org or whatever, because there's a whole houses that's that looks look like it.
		I was inspired by the transition movement from England, where one of the founding members, Rob Hopkins, had this this wonderful statement, something like we are, umm, well as Western human beings we are the most clumsy types of animals on the planet because we don't even know how to build our own house.
		Promoting the project themselves and the municipality as being open minded and green minded.
		There's new ones being attracted by our presence and that now are advocates of of the same story.
		Nowadays there are many more eco-villages and eco-communities on the rise in the Netherlands.
		"An Inconvenient Truth" was just in the cinemas and really felt like the perfect storm for us. From the beginning, climate change was one of the main reasons for us to want to build an Earthship community.
		"Olst in Transition" very much was also inspired by the whole idea that we are at the end of the fossil fuel era and we have to mitigate for climate change.

Interview #7

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	I found this house on a websites for house houses for sale. I also saw a lot of projects that did come true but kinda lost the main purpose. I think there's also some projects in Amsterdam social community way of living, but it still looks a little bit more like a normal living place. We're gonna build everything from ecologic materials and then the construction some construction guy came and said like, yeah, but you need to use concrete.
	Inner	I think they [founder of de Aardehuis] are really they did a really good job at creating this together and without giving up. it's really impressive to see a group that did not really know each other at the first time (...) managed to do so [build de Aardehuis]. We will that will be alright and the community is really nice, but they are of course a bit older than then we are. It's also good to have to live together with people of your own age, because there is a sometimes a bit of a difference between the way they live and us. If something happens, everyone knows about it directly (...) it's some sort of a collective problem for something then. We got a lot of respect for the people living here still that actually build it. There are some people in the area that still say I would do it again for sure.
	Expectations	This is really the a unique chance to live in a place like this, a dream to live in some something really special. [When we first saw it] it was even better than expected. So the expectations were actually we didn't have that many expectation. Except for the thing that it was gonna be a really cool and also challenging way to live there. We could live a bit more in nature or together with nature. To feel more connected again with the environment. This is something special. This is something that you can be proud of to live in and that you can make your own.
Structures	Rules	We [the Netherlands] are really have a lot of rules of course and there's a lot of you have to do it altogether. Let's build an eco-village and then there are some problems that can just easily be solved with an ecologic way of building. You need to use this steel or whatever, because other otherwise the house is gonna collapse. I do think the Netherlands is still making it a bit difficult to be fully off-grid.
	Cultural Norms	I think a lot of people kind of lost the connection with nature too much and I felt that for me. I think in the Netherlands, we are always looking for different ways or exploring/pioneering in how to live differently. I think if I look at a lot of people living in in the Netherlands, they just want things to be fixed and they want things to work. I never understood that people live in a house that is like a copy. I think of a House should be like a really a version of yourself or something like a copy. I think the way of living in a community is I think it's going to be more important for the future. If something happens, everyone knows about it directly (...) it's some sort of a collective problem for something then.
	Resources	The house was empty for two years because of some difficulty between the party renting it. Some things just takes a lot of time and I now realize that if you live in a house like this, you cannot, like, make your dreams a reality in just a few years. Let's build an eco-village and then there are some problems that can just easily be solved with an ecologic way of building. I did some more research and heard from other people who tried that [some ecological materials] they were like, yeah, you should not do that because they're gonna live animals inside.
Stories	Experiences	I think this idea [de Aardehuis] is a step too far for treating it in a bigger scale. It has also some problems and I don't, I think there it could be a good example in in some parts. I think it only fits a few people who are really puts a lot of attention in it. There's a lot more that we like about living in a community that compared to what we don't like. I'm kind of sometimes kind of a dreamer (...) now I realize (...) I'm not really sure if I'm still gonna do this in the future, like building a whole community. You have to work for this dream constantly. That's something I did not realize that much when I can't get in in the house. I discovered that it isn't all really sustainable. You have these toxic materials actually putting into your house. I was kind of upset and nice and like that this is not the way.

Decentralization	It needs to be ecological but it also we don't want to fix the roof in five years again like that's also not sustainable.
	I think it also it would be really cool to create more place for shared cars which are like electric and that we can use the electricity from the sun.
	We could live more in a even more sustainable way together.
	We still need the normal electricity network and we sometimes deliver for the network.
	Think it would be just a matter of time and maybe some new developments to make it really possible to live off grid with the whole community.
	I think also necessary in terms of you know. I'm really curious how it how this looks in in five years would be really cool to live really off the grid.
Contextuality	My interest in alternative architectural always there already. And so I noticed project and I kind of follow it's the in the whole building process.
	I'm always looking for alternative ways of living.
	I think a lot of people kind of lost the connection with nature too much and I felt that for me.
	I think it's a good example for living more eco way, but I think it's too extreme for me to do it on a bigger scale.
	I never understood that people live in a house that is like a copy.
	This is something special. This is something that you can be proud of to live in and that you can make your own.
	I think the way of living in a community is I think it's going to be more important for the future.
	I'm kind of sometimes kind of a dreamer (...) now I realize (...) I'm not really sure if I'm still gonna do this in the future, like building a whole community.
	I discovered that it isn't all really sustainable.

Interview #8

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	We read it in the newspaper [about de Aardehuis proposal]. There's more room for projects like this or for like tiny house in Olst we have three of these projects next to each other. There is there is a group. I don't know how big it is, but they are interested and well, they visit our neighborhoods and our also the other next to to us so they can see what can be done. We had availability and community. We had a few times, so people from abroad who came here and stayed here for a week and told us how great we are.
	Inner	Other type of people were also dreaming, but we were also practical and I think a lot of more people joined in the group who were also very practical, very hands on (...) Still the group is very diverse. We had the feeling that this project, well there were concrete plans and ideas and working groups. We were people with no building experience and we were like a building company without being a company. You know your neighbors and Grown Ups and the kids and so but that's. I think it's a good mix. We had availability and community. We had a few times, so people from abroad who came here and stayed here for a week and told us how great we are. This has to do with maintaining relationships and the issues. Very hard work. And yeah, and some people can't be bothered. And that is a problem. Lot of people and I don't go to the meetings. I don't go to the meetings myself anymore because it was too frustrating, so I ended up with will decide what you want.
	Expectations	Sometimes when I visit projects you sort of wonder why isn't this happening? And that's usually coming down to a communication of expectations. It was more of a subconscious wish to be more environmentally engaged. I expect to be more in a more green environment surrounded by people who shared my values. There is some basic level of community. Because what we all did together. But maybe we expected more. That [covering the carport with a roof and solar panels] changed the looks of the place. We thought it would change the look for the worse, it turned out really well.
Structures	Rules	You need people who are more in the lead and make decisions and go on and look at the, the prospect of the whole. If you want to change, you'll have to do them all. Yeah, that's the way to be serious about it and be large scale about it. If you have a right to veto you must also make try to think how can I make it possible if I have an objection what can I do myself to make it possible. It's still taking a lot of effort if you want to do that decision making. It's also the way the decisions then made. It's not good organized or some people think. Most of these communities, they end up with fighting because it doesn't work if you have a like a veto power.
	Cultural Norms	[Before building de Aardehuis we were] living in the street or other people had two cars and we're not really interested in the idea. I don't want to live in a commune, I also need my privacy and maybe make it as acceptable for like part of the population. There's not a lot of imposed interaction. So, it's very voluntarily based. Still there are a lot of people who think, well, it's a messy or well, you can't change their mind. You see Grown Ups and teenagers together playing a game like that. And it's normally it's very segregated and you have your people, your own age where you interact. Lot of people and I don't go to the meetings. I don't go to the meetings myself anymore because it was too frustrating, so I ended up with will decide what you want. Most of these communities, they end up with fighting because it doesn't work if you have a like a veto power.
	Resources	The communication process is a very big factor in in succeeding. We had the feeling that this project, well there were concrete plans and ideas and working groups. Technical things, some communication, the money and all, we were very trusting that there would be houses in a few years, as there should. You need people who are more in the lead and make decisions and go on and look at the, the prospect of the whole. There are a lot of young people who can't afford big house and want to. This because of environmental issues and it's very difficult to find a place where you can build it.
Stories	Experiences	[Other] work projects, there were a lot, there was a lot of talking and not building. It's quite a miracle that there are 23 houses (…) that nobody, yeah, was seriously injured, or even that we're still a community. Sometimes there was a problem when we couldn't agree and then then later we did. I like to talk, but it must be a bit rational and efficient.

	We were people with no building experience, and we were like a building company without being a company.
	I agree with the plan with the parking, if there is more place for bicycles also for visitors.
	At the end, we were all very tired of meetings and making decisions.
Decentralization	And also, the way we heat and cool it, I think it's a good example. We wanted to make a visible example of how we can proceed with that.
	We have shared car system.
	We have this carport across it with solar panels and now we have some cars, car sharing programs (...) My neighbor, he wanted to sustainably charge his Tesla so he said I want to invest in solar panels.
	We have all solar energy. So, there's a lot of solar in the energy in the spring and summer we don't, and you need energy in the winter for the heating pump and so and you can't store it all.
	If every new housing estate would have some kind of microgrid that would sort of help (...) but it starts with using less energy than now.
Contextuality	We were living a life that is more sustainable, we were for a long time trying to do that.
	I think the way we did it is like it's very good adapted to climate change in the way that, uh, the rules are green.
	I think we show people that you can live in this environmental friendly way with other greenery.
	That was on the level of what you can do. So that's eating less meat and we do seriously need to cut back on dairy.
	We were always very aware of the climate problems and other very middle of the and like biodiversity. So that's something that just has big problem.

Interview #9

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	The Netherlands, as in the government's policy there, there isn't. I don't think there are many equal project efforts really on that part. I don't think the vision, or the policy is up to standard. I think they [the government] are lagging behind. Volunteers who wanted to do something like that themselves and they could experience themselves it. Almost every week people approach me and say oh this I heard there was there was a house for sale in your area.
	Inner	I like that also in the way people interact. It's, you know, your neighbors. We don't have fences. That's way broader because we had two sons there, and how they interact with Grown Ups and young people is quite unique. Normally you only have interaction Grown Ups within your own family. Or maybe very specific adult people, but this is sort of you have a natural backdrop. We noticed after the building process that some people are very well, they just say no and I don't want to reflect on my own. If something bad happens to somebody, people would bring food or cut the grass or, you know, help (...) but I find it is more on an individual level than it is on the Community level. People cannot keep coming back to their earlier decisions, few individuals can break or make like a community like this.
	Expectations	You know your neighbors, so that those were the two and aspects that that attracted us to the project. You don't have to be the same but and you have to be able to work together you live together yeah and engage in a project. I didn't have [many expectations]. Your idea is of people that are more in the same league and still you have to take into account of everybody's interest. I have a hang up with fairness and being honest and being, you know, making an effort into relationships (...) I thought that it would be a dedicated group and that everybody would be understanding of each other or accommodating.
Structures	Rules	It can be a problem if you want to make a decision, and everybody has the right to veto. All of us are committed to the rules (...) but in some level something is damaged especially with doing more than we have. There's a veto. Well, first of all, it's not rational.
	Cultural Norms	We also wanted to know what type of group it was. How the people were? Do we fit in? Are we kind of the same people? You don't have to be the same but and you have to be able to work together you live together yeah and engage in a project. It's not that I go around and forbid people to eat meat or something, but you sort of expect that is a natural concern for them. We noticed after the building process that some people are very well, they just say no and I don't want to reflect on my own.
	Resources	The housing market was very, very bad. It's bad now, but it was the opposite where you know where sales were going down.
Stories	Experiences	You feel very deeply connected here because of the long building project, a process and you know it's been 10 years since it's finished. It was very formative as a project process, and I find speaking to people who have just entered early stages of a project that you don't want to spoil their joy or faith. Maybe I wouldn't dare to do such a program again. What I found painful and still do is that even though we've taken on this project together, that does not necessarily mean that we share all the values even within the ones in the mission statement.
	Decentralization	It's green and the community building and together we have the water system and the energy system. It was unanimous [the decision to install solar panels in the carport roof], but it took some time because a lot of me too was like, it's a bit big structure. The latest developments have shown that, you know blackouts are coming. New housings cannot be attached to the grid anymore. So, I think micro-griding might be part of the solution.
	Contextuality	Your idea is of people that are more in the same league and still you have to take into account of everybody's interest. I still very, very much adhere to that vision statement [of the website]. We tried to do it all and people are still coming here and getting inspired by the way we do it. That you want to be on Team Planet, you know, and you want to promote sustainable goals or you want to fight climate change.

Interview #10

Element	Code	Excerpts from Transcripts
Stakeholder	Outer	The electricity law… regulation, we're not the organization that regulates the legislation itself. The project was in my sights, so I could influence some in, in our organization or in a positive way. We have that contact and, in the past, we supported the Aardehuis with the Serene project that is the new car rooftop panels (...) we did not finance anything. We have had contact about this and because our network electricity network from Enexis. There's contact with Enexis so that all the utilities we can combine the work. We are shareholders of Enexis. There's more sustainability, more thinking about this but also the social influence they have because of their state of mind that they are more investing in their community. We have recently organized a session with all the team leaders of the municipality of Olst-Wihje (...) we have two sides of this program is the regular of building more network for electricity, and the other is innovated and make smaller grids to electrify communities.
	Inner	I was not so involved that I had regular contact with the group that was building it. (…) when it was finished, we had some contact about the waste organization of the whole area. I follow their projects to be off grid or to be more how to know. Self-sustaining. There are, of course, people at Aardehuis that started with the project but left halfway because it's too much. Ardehuis is just part of the village, it's not so very different anymore. It's still too much depending on the person that is the project leader.
	Expectations	I was afraid that this Aardehuis community would be like a little island. Where other people would look at it and think they're strange, right? Something else? Not our kind of people. For our municipality also, so we try, with my colleagues, to hold on to what we've learned and to still build sustainable. We're not ready, but in Aardehuis I see what we have learned, and I think there are possibilities to do this kind of project.
Structures	Rules	We follow the rules, but we also look at what, uh, how can we interpret this is possible to do something more creative (...) This was for us also a moment to learn how to do this. We have a very large building crisis. I'm very afraid that we forget about what we learned about sustainable building. It stays with a few people that are really focused on sustainable building and determined to make this work and it's not. Something that we have put into a formal format (...) When you make this formal, the chances are that it might make it threatening for people to try to engage with it.
	Cultural Norms	They participate in cultural things, music, theater, and all kinds of stuff. The social things. (…) They initiate, they take this kind of initiatives. [Aardehuis] turns out to be very different and the village of Olst thinks very positively of Aardehuizen. There are a lot of people more that we need to push a little bit more to sustainability. Aardehuis, they love biodiversity, so they grow all kinds of plants and weeds and people saw that negatively (...) I don't hear anything now about complaining or something. I think Aardehuis did it very smart too; they invite people to come and look and tell the story about the community. Aardehuis is very integrated now in the village, I think that acceptance of new projects is more easy and smooth because of the community.
	Resources	Things to be done in the future to make the electrical network more balanced and being ready for more electricity in the future. We have projects like solar fields and then we are working together on that level also with the bigger projects. I think we must talk to more construction firms because you cannot expect people to build their own houses, that is wrong.
Stories	Experiences	But because it's so new [microgrids], and because there's so few knowledge about this in our municipality and we are exploring ourselves a lot about this, how this works. There's more sustainability, more thinking about this but also the social influence they have because of their state of mind that they are more investing in their community. I think we must talk to more construction firms because you cannot expect people to build their own houses, that is wrong.
	Decentralization	I follow their projects to be off grid or to be more how to know. Self-sustaining. But because it's so new [microgrids], and because there's so few knowledge about this in our municipality and we are exploring ourselves a lot about this, how this works. I think it's a good example of the power that people have and the opportunities that they must build and create our own space and that we are less

	dependable of big projects/builders. Yes. I think we can help them out because of the energy crisis being more urgent now.
Contextuality	I am more sustainable thinking so my enthusiasm for this project is of course very different than someone who's working with traditional housing. [Aardehuis] is for a little niche of people wanting this.

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