

Article

Transformational Ability of Energy Network Companies: The Role of Institutional Logics and Boundary Spanners

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Abstract: Energy network companies play a vital role in energy transitions. The transformational ability of these companies influences the process of energy transitions and the effectiveness of policies in this domain. This study shows the need for managers of network companies as well as scholars and policy makers operating in the midst of energy transitions to acknowledge the importance and value of boundary spanners in improving the transformation ability of these companies to play their role in facilitating energy transitions. Evidence comes from an in-depth analysis of an energy network company in the Netherlands. Our findings show that the transformation ability of energy network companies depends on various instances of boundary spanning as these organizations address differing or conflicting intra- and inter-organizational institutional logics when contributing to an energy transition. In the context of energy transitions, inter-organizational boundary spanning generally demands more resources and attention than the spanning of intra-organizational boundaries. Additionally, intra-organizational boundaries affect inter-organizational relationships, particularly in the policy arena. Our findings indicate that to carry out the type of institutional change that an energy transition requires, more attention and resources should be dedicated to intra-organizational boundary spanning, even as the need to connect external stakeholders increases.

Keywords: energy network companies; transformational ability; institutional logics; boundary spanners



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1. Introduction

The challenges that today's energy sector faces while converting to more sustainable forms of energy production are unprecedented. In many European countries, companies managing public energy networks play a crucial role in facilitating this transition [1–3]. A fundamental transformation of these companies is necessary for the conversion to a fossil fuel free world (e.g., [4–6]).

While re-determining their commercial, public, and legal tasks in this new context, energy network companies have to navigate a broad collection of institutional logics: the socially constructed patterns of symbols and material practices, assumptions, values, beliefs, and rules by which individuals and organizations produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality [7]. Differing institutional logics can lead to trials and tribulations that effect the necessary collaboration towards transition-related goals [8,9]. The existence of these differing and conflicting logics can result in boundaries that hinder collaboration and make it difficult for these companies to achieve these goals. Difficulties in collaboration may stem from differences between the energy network company and other organizations (i.e., inter-organizational institutional logics) and within the energy network company itself (i.e., intra-organizational institutional logics) [10]. Zooming in on the institutional dynamics of these collaboration efforts, attempts to deal with these organizational institutional logic boundaries that hinder collaboration will require boundary spanning [11]: the maintenance of in-depth contacts of an employee with employees from other organizational units or

even outside the company [12]. In this context, boundary spanners can cut across intra- and inter-organizational boundaries of energy network companies to move ideas, information, decisions, talent, and resources where they are most needed. Such activities are important for energy network companies because they ensure that these boundaries do not hamper the flow of information, ideas, resources, and people. Boundary spanners are individuals within the companies who establish and maintain these organizational linkages [13,14]. Hence, the ability of network energy companies to span these boundaries enables them to deal with the resistance caused by the existence of conflicting intra- and inter-institutional logics and is, therefore, crucial to the success of the transformation process of energy network companies in their need to navigate the energy transition.

Given that boundary spanners and the process of spanning organizational boundaries result in a very complex and rich field of research terrains, understanding how individual boundary spanners contribute to the transformational ability of energy network energy organizations is a practical necessity [15]. Because these network companies are key for energy transitions, understanding that boundaries resulting from different or conflicting inter- and intra-institutional logics and how to span these boundaries can influence internal and external collaborations and can create new pathways in the contribution of energy network companies to an energy transition and their transformational ability in the transition.

As part of this transition, a set of dominant perspectives to study the relationship between the network companies and the energy transition have emerged, featuring a multi-level perspective on socio-technical transitions, strategic niche management, transition management, and a focus on technological innovation systems. Each focuses on understanding how transitions evolve over time and often generates explicit policy recommendations to support progressing transitions [9]. Besides a growing strand of the literature on transition and policy (e.g., [16–18]), the aforementioned mainstream perspectives have remained at the core of research on collaboration between multi-level governance actors, including the energy network companies, in energy transitions [19–21]. Although, the energy transition literature has recognized the crucial role of these energy network companies in the process of navigating the transition in collaboration with a broader stakeholder field [22,23], research about the ability of energy network companies to transform themselves in the process of an energy transition through a boundary spanning lens is limited [15]. Research on the role of boundary spanners in energy transitions has resulted in a multi-level perspective [24] while exploring how energy network companies are dealing with the existing differences in inter-organizational institutional logics [3,25]. However, in their transformation process, these companies not only have to deal with inter-organizational boundary spanning but also with intra-organizational boundary spanning [10]. Currently, little is known about the inter- and intra-organizational boundaries of these companies and how these companies can span these boundaries.

Therefore, the aim of this study is to explore the role of boundary spanning within energy network companies to address different or conflicting inter- and intra-institutional logics in contributing to the needed transformation of the network companies in energy transitions. It explores how institutional logics create boundaries in complex organizational structures, hindering collaboration, and how companies use boundary spanners to meet their transition-related goals. Evidence comes from a large energy network company in the Netherlands. It is recognized as an innovative frontrunner in the energy transition. This company is aware of its role in the energy transition and the need to transform the organization to fulfill its role, although it struggles to transform the organization. For this study, we interviewed senior managers and executives from the company who were involved in the transformation process.

This paper is structured as follows. First, we develop a theoretical lens providing a deeper understanding of how institutional logics create boundaries in complex organizational structures, hindering collaboration, and how companies use boundary spanners to meet their transition-related goals and enhance the transformational ability of the organization leading. A description of the case and the applied case study method is followed by an

analysis of the empirical findings applying the developed theoretical lens. We follow with a discussion to assess our contribution to the literature and policy implications, finishing with concluding remarks.

2. Boundary Spanning to Enhance the Transformational Ability of Energy Network Companies

As policy goals change and renewable energy initiatives continue to emerge, energy network companies experience a disruption to the dominant functioning of the energy system [26]. For instance, making the energy supply more sustainable introduces new challenges and places new demands on existing and new energy infrastructure. With new sustainable demands providing for alternative business model considerations, selected business models are being reconsidered by energy network incumbents. Fostering inter- and intra-organizational collaboration for achieving their public, private, and transition-related goals becomes crucial to their individual success, as well as the success of the energy sector amid the progressing energy transition. In this process, the companies must work with different stakeholders. However, these stakeholders can pose different institutional logics, and these differences in logics can lead to trials and tribulations when working collaboratively towards common transition goals [27]. This can trigger internal tensions which generate conflicts among members of the organizations that are ultimately the ones who enact institutional logics. Institutional logics are defined as the socially constructed patterns of symbols and material practices, assumptions, values, beliefs, and rules by which individuals and organizations produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality [28]. If institutional tensions caused by differences in logics are exacerbated, they can form boundaries by causing discontinuity in action or interaction [29].

Boundaries between the company and its external environment are formally defined by legal structures, but boundaries within the company can be more tacit and intangible. Schotter et al. [30] view the existence of boundaries within organizations as performing two functions: division and identification [31,32]. That is, they provide a basis for categorizing and dividing different entities within the organization into manageable parts and give those entities a sense of internal cohesion. However, boundaries between entities can inhibit collaboration and cooperation [30]. The inability to bridge the boundaries of conflicting logics between these entities can result in unresolved challenges that can prevent the energy network company from reaching its transition goals or even cause it to fail. If individuals or groups of individuals are unable to span boundaries effectively, a boundary spanner may be able to facilitate the process [33].

Boundary Spanning

Boundary spanners are individual actors who go beyond their routines and are engaged in strategies to manage cross-boundary connections [13]. These individuals function as intermediaries within their organizations in brokering knowledge between two or more separate teams or entities [14]. As such, internal connectedness and external connectedness are necessary but not sufficient conditions to perform an informational boundary spanning function. This leaves effective boundary spanning to those who are both well connected to external information areas and who also are well connected internally, so as to disseminate new information and new ideas to their more locally oriented colleagues [34]. Tushman [35] and Leifer and Delbecq [36] already identified boundary spanning to be effective in assisting companies to manage uncertainty caused by the introduction of new technologies, goals, or demands for resources and capabilities. Boundary spanners can reduce the inefficiency of misinterpretations and miscommunications and empower goal realization through social support [34,37]. Matinheikki et al. [10] find that boundary spanning should be actively encouraged and facilitated to maintain collaboration within a complex organization and with the organization's stakeholders to mitigate institutional boundaries.

Boundary spanning can exist at different levels of analysis. Marrone [38] shows the existence of boundary spanning between organizational work teams and their internal or

external environment. She concludes that team boundary spanning exists in a multi-level system, where boundary spanning can occur across levels to facilitate outcomes at each level: member, team, and network. This is particularly important as organizational designs evolve to include levels that were previously on the outside.

The expertise of boundary spanners in selecting, transmitting, and interpreting information originating in the environment determine, in part, the ability of organizations to deal with these challenges and to adapt to the new demands and requirements [39,40]. They seek to connect a company or a subunit within that company to an entity in its environment by selecting, transmitting, and interpreting the information in a way that the organization can digest and incorporate. To accomplish this, the boundary spanner should be able to comprehend or adopt the institutional logics held by the collaborating entities in the organization's environment so that their own rules, norms, and routines match those of the collaborating entities. Simultaneously, the boundary spanner should be able to reach out to others effectively, bridging both formal and informal institutional divides in the process [41]. The roles of the boundary spanners and their ability to deal with the resistance caused by the existence of conflicting institutional logics are crucial to the success of the transformation process of companies in general and energy network companies navigating energy transitions specifically.

3. Methodology

3.1. *The Case of an Energy Network Company*

Publicly governed private sector companies—Distribution System Operators (DSOs)—play a critical role in facilitating the energy transition for both gas and electricity in the Netherlands [3,9]. Municipal governments are the primary shareholders of DSOs, which are responsible for the infrastructure that brings energy to homes and businesses. They currently operate as organizations with complex structures, based on a for-profit model but with public shareholders. The role of these companies is firmly grounded in legislation, rules, and regulations. They have an ethical and legal obligation to maintain the national and regional infrastructure and should supply consistent, safe, and affordable energy. All companies are required to provide quality of service and availability of the network whilst simultaneously operating as efficiently and effectively as possible.

As policy goals change and renewable energy initiatives continue to emerge, DSOs will experience disruption to the dominant functioning of the energy system [26]. The goals and initiatives provided in the political arena generally fail to provide these companies with clear guidance and frameworks for actions [3]. Furthermore, the legal- and regulatory-approved technical guidelines are leading in the daily operations of these companies. These operation-oriented guidelines are also not helping the companies to deal with the new requirements and demands related to the energy transition. However, the energy transition calls for substantial proactive investments from the DSOs and a new role for these companies. In response, these companies have started to transform themselves to play their role in a more sustainable energy system.

The sector is dominated by three DSOs: Alliander N.V, Enexis Group, and Stedin Group. Each of the three owns about 30% of the gas and electricity grid. The remaining 10% is cumulatively owned by several smaller DSOs. The energy network company that we follow in our study strives to play a leading role in facilitating the Dutch energy transition: the distribution system operator Alliander. In recent decades, the anecdotal reputation of Alliander in the Netherlands has been that of an innovative frontrunner in the energy transition. It is the largest Dutch distribution system operator in terms of its workforce, with 5703 full-time employees at the end of 2019. It transported 28,548 gigawatt-hours of electricity and 5860 million cubic meters of natural gas in 2019 and had a revenue of EUR 1.930 billion and profits reaching EUR 253 million.

Alliander is a group of organizational subunits, all dealing with different aspects of the energy system. For this study, the most relevant are Liander, the network operator which is responsible for distributing energy across the grids, and New Business, the

innovative solutions subunit of the organization which is responsible for supporting and scaling energy start-ups in house. Liander's primary focus is making sure that the public's rights to consistent, reliable, and affordable energy are met. New Business, on the other hand, is focused on innovative solutions, leaving room for creativity and even failure. It works with start-ups to propel forward-promising innovations, specifically regarding the energy transition.

3.2. Sampling

To explore the role of boundary spanning within Alliander to address different or conflicting intra- and inter organizational institutional logics in contributing to the Dutch energy transition, an exploratory approach was taken. In interpretive social research, the key to understanding organizations lies in understanding how they produce order and meaning [42]. Managers can be defined as experts on the content of their knowledge but also by a specific system of knowledge representation on the organization [43]. Consequently, expert interview is a useful and suitable instrument for collecting and analyzing the complexity of organizations [44], especially when aiming for increasing the understanding on how individual boundary spanners contribute to the transformational ability of network energy organizations [15]. Therefore, we conducted interviews with experts with influential roles within the permanent teams and task force of Alliander to identify the existing different or conflicting inter- and intra-organizational logics and the role of boundary spanners.

For this research, 12 senior managers at Alliander were interviewed. As these managers had been involved in the transformation process of Alliander and the contribution to the Dutch energy transition, they formed the main source on the complexity of organizations (as emphasized by [44]), making them experts on boundary spanning and the transformational ability of the network energy company (as identified by [15]). Interviewing the 12 experts resulted in data on the boundaries created by the differing or conflicting institutional logics across diverse parts of the organization during the transformation process, the role of boundary spanners, and how they dealt with these boundaries. Table 1 shows an overview of the study participants. Positions are generalized to avoid identification of the respondents.

Table 1. Respondent Overview.

Respondent	Gender	Position/Level
A	Male	Engineer
B	Female	Corporate Venture Developer
C	Male	Strategy Consultant
D	Male	Cluster Lead
E	Female	Cluster Lead
F	Female	Innovation Manager
G	Female	Program Manager
H	Male	Program Manager
I	Male	Senior Program Manager
J	Male	Senior Strategy Advisor
K	Male	Director
L	Female	Director

During the interviews, respondents were asked to share detailed examples and stories about boundaries created by the existence of intra-institutional logics that they have experienced. Additionally, we asked them also to share examples of how they personally dealt

with these boundaries, standard practices for how to address them, how they experience the role of boundary spanners, and how any of this may influence the transformation process.

3.3. Data Analysis

The results of the interviews were analyzed by reflecting on the transcripts using the theoretical lens on institutional logics, boundary spanning, and spanners in relation to the organizational ability to contribute to the energy transition as it can be found in the literature section. The interviews were coded by the first author, with feedback from the other authors throughout an iterative process. Each interview was coded in three steps. First, any challenges to collaborating with internal or external stakeholders were coded as boundaries, and the perspectives on either side of the boundary were coded according to institutional logics framework of Thornton et al. [7]. Second, any actions to address those challenges were also coded according to the same framework. Finally, the role played by boundary spanners was coded as such.

Coding the challenges to collaboration and logics on either side was straightforward. In most, if not all cases, boundaries were clearly identified by respondents. Some challenges were perceived by the respondent, while others were measurable. In cases of the former, care was taken to assess the respondent's own language as closely as possible, especially in the process of assigning logics.

4. Results and Discussion

4.1. External Boundaries

Overall, we find several boundaries that exist and persist internally within Alliander and between Alliander and its external stakeholders. Figure 1 shows specific boundaries, which were identified by the respondents.

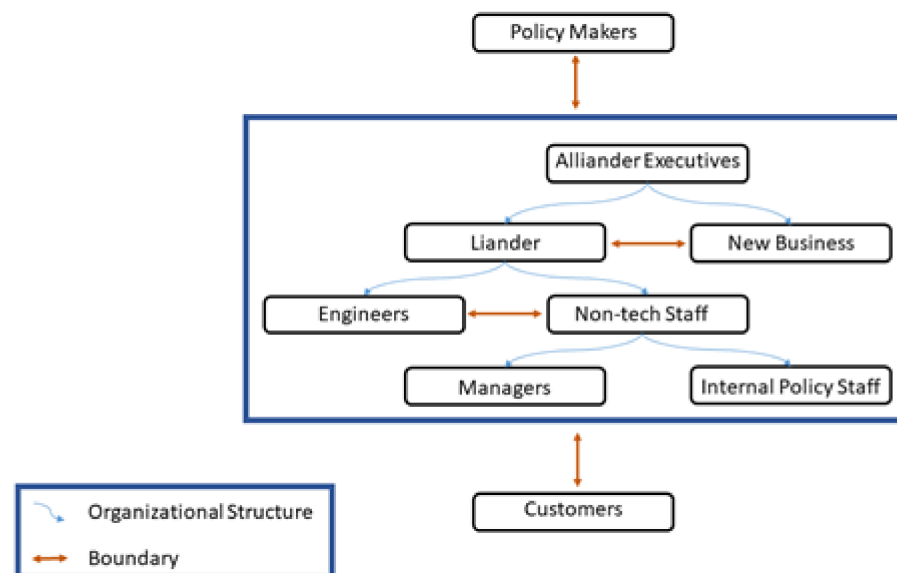


Figure 1. Respondent-identified boundaries.

External boundaries with customers exist at different layers, and job titles within the organization, both technical and non-technical, range from team leads and managers to local and national policy advisors. All respondents from the division Liander unanimously agree that boundaries between external organizations do not really persist, as Alliander has made boundary spanning in these relationships a priority. As described by senior manager J:

“... we actually say that we do not want to follow regulation, but we want to steer the regulation. Additionally, if you want to steer regulation, you have to be on the right stakeholder level. So, you have to be inside The Hague and The

Ministry on the right level and the same in the cities. You have to be a partner in the right level. So, I think that we are trying to move up to get more influence . . . and not only to influence but to get our voices heard in The Hague on the highest level and, well, Amsterdam on the highest level as well.”

Or as illustrated by Respondent I:

“ . . . we realize that cooperation is needed to deal with the challenges of the energy transition and to achieve the transition goals. The need for collaboration is also acknowledged by our external stakeholders. Regularly, we are sitting around the table with them to discuss the goals, policies, regulations and requirements regarding our common interest, the energy transition.”

However, respondents on the New Business side are more skeptical about the status of progress in this arena, although they are also trying to span the boundaries. For example, Respondent E, a Cluster Lead in New Business, stated:

“I think that the relationships with the public partners—they are [. . .] the municipalities or the provinces or the national governments [are lacking]. You need to lobby a lot in The Hague. I think that needs to increase a *lot*, not only on the level of the board but also on our level—so we need to be outside rather than inside”

Hence, senior leaders at Alliander have made it a priority to ensure that the boundary between Alliander and policy makers is consistently and effectively spanned by a multitude of boundary spanners. Each boundary is addressed with different institutional logics by parties on either side of the boundary. When logics on either side of the boundary conflict, a boundary spanner may help the parties on either side of the boundary to collaborate more effectively.

4.2. Internal Boundaries

Internally, boundaries exist between Liander (the network operator) and New Business (responsible for innovation). New Business works with start-ups to propel forward-promising innovations, specifically regarding the energy transition. Liander is responsible for making sure that the logistics of providing consistent, reliable, and affordable energy are in place. Other internal boundaries exist within Liander between engineers/technicians and non-technical staff. Engineers and technicians are focused on technical design and problem-solving within Liander, as well as IT solutions throughout all Alliander, while non-technical staff range from team leads to managers to policy advisors.

The analysis of the data on the internal boundaries coming from the expert interviews at Alliander shows a misalignment between Liander and New Business about the state of inter-organizational boundary spanning. In fact, respondents from either side of this boundary demonstrated one institutional logic in common: Profession. Table 2 presents an overview of the existence of the different institutional logics and the boundaries within Alliander.

Table 2. Overview of the existence (X) of institutional logics and boundaries within Alliander.

	Liander	New Business	Engineers	Managers	Engineers	Internal Policy Staff
Community	X					
State	X		X		X	X
Market		X				
Profession	X	X	X		X	
Corporation		X		X		X

Even though Liander and New Business have one logic in common, Liander is driven more by State and Community logics. New Business, on the other hand, is driven more by: Market and Corporate logics. This finding is in line with the perspective from Respondent

E that “[Liander] is risk avoiding and [New Business] is risk taking,” and that “If you want to make money, you need to take risks.” Liander, on the other hand, avoids risk to fulfill State and Community obligations, focusing on their responsibility to provide reliable and affordable energy to all. Respondent G from Liander mentions:

“What is difficult is that we should also deliver, and we have difficulties in connecting everyone at this moment, because the energy transition is going so fast.”

From the New Business side, respondents state that the State logic from the Liander side of the boundary has a particularly powerful impact on them. The status of regulation determines the direction that startups at New Business can take. As Respondent K puts it, “We do business with a hand on our backs”.

Despite the existence of a boundary between these two organizational divisions, no attempt at boundary spanning seems to exist. Instead, decisions related to the cohesive integration of both parties are reported to be made top down, by the board and carefully chosen upper-level managers in conference room settings. Acute challenges seem to only be addressed from one side. Specifically, New Business caters to the logics of Liander. Respondent B from New Business offers an example, in which New Business sacrifices market potential for the stability required of an organization, within which the community logic is prominent:

“... within Liander, there is the opinion that New Business costs a lot of money. Additionally, we do not want that to be the opinion, we want to contribute financially to Alliander and not cost a lot of money. So, we focus more on the short-term financial investments of our companies but the consequence is that we invest more in mature companies that already have a market because they are attractive and they earn money and the young companies that can potentially be very disruptive and interesting, also for a networking company, they cost a lot of money and it often takes seven years for a start-up to [...] have a return on investments. Seven years is a long time, and we do not have that patience anymore, I notice.”

Challenges stemming from this structure, as reported by New Business respondents, are generally related to funding structure and risk aversion. However, there is also the perspective from the Liander side that this boundary, though it exists, does not hinder Alliander in meeting its transition-related goals. Respondent L is particularly insistent that the answer is to invest less money in the New Business startups because the more money that the startups take from Alliander, the more likely they are to listen to Alliander instead of their customers. She also claims that from the perspective of Alliander,

“... profits are not the main reasons why these startups are here. The main reason is that they can come with the type of solution that is impossible to develop within a large organization.”

This idea is at odds with the financial logics of New Business. Furthermore, the idea that Liander is not sufficiently risk taking to allow leeway for the development of such solutions could hinder progress on this front. Despite this, New Business startups have had some important successes. Respondent L explains:

“If you have a large network and it’s all about scale, then you come up with the idea of smaller networks that have everything else but scale, and you optimize it from a digital perspective,”

This explanation is followed up by a detailed example, micro-grids, in which this is being successfully achieved. This shows that while a boundary clearly exists between Liander and New Business, the presence of this boundary may not hinder the development of innovative solutions for the energy transition.

Internal boundaries also exist between Engineers and Internal Policy Staff and Engineers and Managers. These boundaries highlight a problem that is spread throughout the

organization. Respondent I estimates that about half of the staff consists of technicians. The existence of these two types of intra-organizational boundaries means that all technical employees and all employees who collaborate with technical employees have the potential to be affected by them. In turn, most of Alliander is likely to have experienced this boundary, either directly or tangentially.

Engineers and Internal Policy Staff have the State logic in common. However, engineers are more focused on improving their technical skills (Profession logic), and policy staff are more focused on the Corporate logic. Respondent I, a senior manager with a technical background gives an example of how this misalignment in values can affect the organization:

“Every day, we build new cables that are [. . .] from a technical view, [. . .] not necessary. So, we build more grids than [are] necessary.”

This respondent goes on to explain that the current situation can run both ways through a cable, making it easy to create systems in which customers share delivery cables. However, because the law states that every customer has a right to their own cable so that they may choose their own energy provider in a free market setting, DSOs end up laying twice as much cable as technically necessary. In practice, this law does not make sense because you cannot practically build multiple grids, thus making energy distribution a natural monopoly. Since natural monopolies are heavily regulated in the Netherlands, this law is just a drop in the bucket of regulatory control and, as such, has not been addressed due to higher profile regulations taking priority in table discussions. Thus, the stakeholder relationship between Alliander and policy makers takes priority over technical efficiency. Of influence on regulatory bodies, respondent K says:

“Of course, you cannot try to win every battle, so you have to [. . .] focus on certain things. I think we have learned in the past; we had the tendency to show the world that we know what is needed. However, that is of course, from our perspective. Additionally, there are different angles to look at the problems.”

In other words, even when a technical problem reaches these selective discussions, it is looked at from many angles, including non-technical ones. Not having enough technicians at the table could result in the technical angle being lost.

Engineers and Managers (including team leads) have zero logics in common. Once again, engineers are driven by the Profession logic, focused on their own technical skills. They are also driven by permits and other regulations—the State logic. Managers are focused heavily on the position of the Corporation and their own position within it. Respondent A describes a lack of technical knowledge among team leads and managers and why he feels that this boundary is so difficult to overcome:

“ . . . the [real] tech nerds, they are not always that good in communication. Additionally, [. . . they have] blinders on. Additionally, when they communicate, they cannot explain exactly what they want to do and they cannot explain exactly what we are doing to someone, who does not know anything about electrical engineering. Additionally, as a team leader, I think it is critical to communicate the things that happen [on] your engineering team—also the technical things—to the layer above. To communicate in a way that they understand what’s happening. When the team leader does not get it, they cannot communicate it.”

It seems that this boundary is more likely to be overcome if the engineer is a long-time veteran at Alliander or otherwise particularly well-connected within the organization. To explain how engineers can address boundaries, Respondent A describes:

“It is also your network. Normally, a starting engineer knows nobody. Additionally, they are going to communicate to the team leader, the team leader communicates it farther into the company. However, if you know some key persons, you can put them in the CC of the mail and then hope they will see it and pick it up.”

This means that a well-connected engineer may be more effective at involving boundary spanners to help address persistent boundaries when their team leads are not doing an effective job.

Engineers are in a unique situation. They are hired for their technical knowledge and skills but are sometimes expected to succeed or even excel in a customer-facing role. One example of informal inter-organizational boundary spanning for engineers comes in the form of Respondent D, who claims to have voluntarily taken on the role of encouraging engineers to adopt the Community logic to help facilitate customer interaction in cases where the customer is heavily focused on community (such as municipalities). He states,

“I think it’s a cliché, but still, I think you have to teach technicians to think customer-centric. Because they are very technically driven, and they forget that there is a customer at the end.”

He addresses this via direct contact in the form of informal conversations and relationship building. No evidence was found of similar informal boundary spanning initiatives addressing intra-organizational boundaries.

Engineers and technicians cite formal structures such as the work council or the unions as groups that they can turn to in the event that they feel ignored or misunderstood in the workplace, but this does not fill the need for a more direct link. Respondent A confidently insisted that “... within the company, going through your peers and leaders—I do not think that will help.”

The same engineer pointed out that the layer above himself and his colleagues—team leads—are no longer required to have a technical background. This can lead to circumstances in which the engineer is not able to effectively explain a problem to their direct boss. Since the team leads are meant to act as formal boundary spanners during conflicts or misunderstandings with customers or upper layers within Alliander, this can cause boundaries to persist unspanned.

Respondent I does claim that there have been efforts to increase the technical knowledge amongst certain groups of individuals in boundary spanning roles. He states:

“For instance, we have the department “Klant en Markt”—customer and market—and we have [the department of] Asset Management. [...] they have the relation manager at the customer side and the relation manager at the Asset Management side—they cooperate together. [...] one is the more technical party and they manage the internal world but they often go together to external stakeholders.”

This shows an effort to improve boundary spanning between technical employees and external stakeholders but does not address the intra-organizational boundaries that continue to persist between technical and non-technical employees.

4.3. Synthesis

Comparing intra- and inter-organizational boundary spanning, the findings point to the spanning of inter-organizational boundaries as generally acquiring more resources and attention than the spanning of intra-organizational boundaries. However, intra-organizational boundaries affect inter-organizational relationships, particularly in the policy arena. As the need to connect various stakeholders increases in importance to build coalitions and support for the type of institutional change that the energy transition requires, connecting others across firm boundaries increases in importance. Finding common ground, mutual understanding, and coordinated action is essential to the foundation of success for such change trajectories, as has also been identified in other multi-party complex change settings.

5. Conclusions and Policy Implications

Current research on the energy transition is lacking perspective on the transformation ability of energy network companies and the role of boundary spanners. With complex energy network companies at the forefront of this transition, a mass of differing and

conflicting institutional logics creates boundaries to internal and external collaboration that must be spanned for these network companies to meet their transition-related goals. The existence of different and conflicting logics is affecting the transformation ability of these companies. Boundary spanners can create new pathways in the contribution of these companies to the process of energy transitions. Companies that use boundary spanners to align differing and conflicting institutional logics increase their transformational ability and therefore the effectiveness of transition-focused policies.

Our in-depth observations at the Dutch energy network company Alliander provide for an empirical setting to reflect on the role of boundary spanners in aligning the different and conflicting institutional logics on the transformation ability of the company. Based on these findings, we see that resources are concentrated on inter-organizational boundary spanning with less concentration on the intra-organizational boundary spanning. Energy network companies have made great strides to span the inter-organizational boundaries that have existed between the company and policy makers, injecting themselves into the policy-making process. However, intra-organizational boundary spanning requires attention. This concentration on both inter- and intra-organizational boundary spanning is also emphasized by Matinheikki et al. [10]. Moreover, the Alliander case shows the occurrence of boundary spanning activities aimed at the transformative ability of the organizational at different levels and between organizational teams and their internal and external environment, as is concluded by Marrone [38]. The Alliander case shows that internal boundaries exist that negatively influence Alliander's ability to contribute to the Dutch energy transition. We call for more focus on the role of the internal boundaries on the organizational transformative ability in the light of the energy transition, as this is not part of the debates in the current literature on energy transitions: besides an outside-in perspective, an inside-out perspective is needed.

Moreover, the Alliander case shows the importance of an alignment between initiatives to span boundaries between organizations for the organization to enhance its transformative ability and consequent contribution to the energy transition. The Alliander case shows that the accommodation of inter- and intra-organizational boundary spanning activities should be aimed at coherence between the activities for the boundary spanning to result in an enhanced transformative ability of the organization. As this perspective on organizational boundary spanning is missing in the literature, we therefore call for more research on the interplay between inter- and intra-organizational boundary spanning activities and their influence on the transformative ability of the organization.

The results of this study could be strengthened with a cross-case comparison. This research is based on one case study; we would recommend further research to include more companies, enlarging the empirical setting. First, it would be interesting to see what effect an increase in the number of experts might have on the research outcomes. Furthermore, this study focused on a particular institutional context the Netherlands. Because the Netherlands is part of the EU, its institutional context is intertwined with the EU context. Further research should take the EU institutional context also into account. It would also be recommended to repeat this study in other institutional contexts within the EU. In such a way, we could test the existence of inter- and intra-organizational boundaries and whether spanning of these boundaries was particular to Alliander, or whether it is a more general phenomenon in the transformation process of energy network companies in energy transitions.

5.1. Policy Recommendation for the Profession Logic and Innovation

In addition to the contributions to the related scientific literature, the case study also results in the identification of policy recommendations to improve the transformation ability of these companies to contribute to the process of the energy transition.

The existence of intra-organizational boundaries between units that are responsible for exploitation or exploration is noteworthy for two reasons. First, it opens a discussion about the Profession logic within the company. Thornton et al. [7] identify the sources of

identity of the Profession logic as associated with quality of craft and personal reputation. This means that despite holding the same logic, the rules, norms, and routines can still vary greatly for employees on either side of the boundary. One way in which this seems to affect the organization is through the adoption of risk. Employees responsible for exploitation activities base their reputations on the consistent and low-risk delivery of energy. Meanwhile, for employees responsible for exploration activities, their reputations rest on innovation, which is, in many cases, an inherently risky endeavor. As such, when comparing institutional logics on either side of a boundary, it is important to note that the Profession logic can be both shared and conflicting.

Subunits in network energy companies focusing on exploration can fill a gap in the transition agenda that exploitation units cannot by facilitating the development of innovative solutions without the pressure of rapid scaling. These exploration units do this by supporting start-ups that have the ability to experiment with local and small-scale solutions, such as microgrids. These units are responsible for innovation but find current legislation to be a hindrance to the development and scaling of disruptive technologies. This shows that boundary spanners cannot be seen as standalone information brokers, but rather operate as part of an intricate and complex internal distribution network.

Taking this idea one step further, the dynamic between these two organizational subunits warrants a discussion about whether active boundary spanners need to exist at every boundary. Boundary spanning behavior can certainly serve a purpose, keeping all stakeholders aligned, as the broader literature on boundary spanning would suggest. Given more frequent collaboration, the individuals who find themselves on opposite sides of the boundary may become frustrated by the lack of attempt at resolution, causing demotivation or increased employee turnover. However, if the different units of the organization are merely required to coexist as separate entities, with only the occasional need for executive-level collaboration to define broader organizational policies, the boundary may not necessarily hinder the organization's performance in meeting certain transition-related goals.

Despite this, there is another organizational goal for which better collaboration between these two subunits may still be vital: engaging in the policy arena. We find evidence of misalignment between exploitation and exploration subunits regarding the state of inter-organizational boundary spanning between the network energy company and policy makers. In general, employees of exploitation units are confident that the company has made great strides in injecting themselves into the policy-making process and are unanimously satisfied with the outcomes, while employees focusing on exploration, even those at higher levels, are unaware of these efforts and do not feel that they experience the benefits of these external relationships. As such, despite the efforts taken by the company to inject themselves into policy and use their seat at the table to push the interests of the organization forward, there remains untapped potential to further include the interests of exploration activities, for which the policy activities are currently not visible enough. Therefore, policy-related interests from the company require further unification for leaders to feel secure that the state of inter-organizational boundary spanning is sufficient and that through this process, their interests of employees focusing on both exploitation and exploration are well represented.

5.2. Policy Recommendation for Technical and Non-Technical Staff

Internally, boundaries are more likely to persist (despite attempts at boundary spanning) within the lower layers of the organization. In particular, the divide between technical and non-technical employees is a recurring theme in our study. Respondents identify a shortage of boundary spanners between technical and non-technical employees. A gap in the technical knowledge among existing boundary spanners further hinders the ability to span boundaries effectively. While our empirical evidence shows that engineers are struggling with persisting boundaries between themselves and the layers above them, there seems to be an exception. When an engineer or technical employee is well connected

inside an energy network company, informally, they are more likely to have their issues heard and their needs met. Being on the informal grapevine matters, in other words. Our findings suggest that informal boundary spanners within the organization can bring collaboration-related concerns from engineers to the forefront. However, this phenomenon also illustrates a disadvantage of relying on such an informal system: inequality. Without a formal and effective system of boundary spanners in place, new or otherwise poorly connected engineers will struggle to cross boundaries more than well-connected engineers because they will not have a means of circumventing that boundary. Engineers that do not find connections become isolated on their side of the boundary between technical and non-technical employees. As such, they are forced to either accept the boundary or leave the organization.

This insight fits well with prior indications of various challenges for (technical) employees to take on a boundary spanning role effectively [45]. Furthermore, it contributes to the still small body of literature on boundary spanning in engineering [46]. Tacit boundary spanners simply cannot do it alone in the context of today's modern, knowledge intensive, and increasingly complex organizations. They require resources from upper management and should be part of a system that supports their role. Without an effective internal distribution network, their contributions to an effective transformation in the energy domain are limited.

Prior work on boundary spanning, combined with the results presented in this paper, suggests, as a potential solution, to include more technical people in boundary spanning roles [46], especially in the context of transitions. Some employees may challenge this advice: findings demonstrate a pattern of perception that technically trained people struggle with soft skills. However, this can be mitigated by offering soft skills and leadership training to engineers interested in leadership and boundary spanning positions. Such intervention can potentially mitigate the amount of important technical information that is lost in translation during intra-organizational collaborative processes and encourage more technically efficient and effective solutions to be heard by non-technical decision makers within the company. Broadening the competencies of technicians in this way can benefit many complex organizations in the energy sector as they balance technical capabilities with financial health and the societal need to push the energy transition forward. Overall, our findings suggest that for formal and informal boundary spanning, organizations should consider the need for both technical and non-technical capabilities, as they address differing or conflicting institutional logics when contributing to the energy transition. These insights enrich the decision-making processes of energy network companies in navigating energy transitions. Our insights help managers and policy makers alike to make structural sense of some of the socially constructed patterns, assumptions, values, beliefs, and rules by which individuals affect organizational effectiveness. Keeping an eye on boundary spanning opportunities within these firms may foster improved knowledge exchange, may increase trust, and may well feed into how policy makers define or understand the transformational ability of energy network companies.

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