

Structuration Mechanisms of a Creation Process of Local Energy Systems

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Abstract—Local energy systems (LESs) are becoming increasingly important vehicles for the energy sector in its quest for sustainable energy production, delivery and use. However, little is known about the creation processes of LES and microfoundations of these creation processes. Hence, in this paper, we investigate the mechanisms of LES creation with a case study. We build on multilevel approach to investigate micro-macro mechanisms in this creation process. We explain how macro-level trends and decisions are translated into micro-level through actor properties and meso-level development of the LES. Furthermore, we describe how micro-level sensemaking leads to transformation mechanisms, including institutional work, marketing, and networking. Finally, we also suggest future research avenues based on our findings.

Keywords—Local energy system, process view, mechanisms, Coleman's bathtub

I. INTRODUCTION

Due to rapidly developing climate change, the development and commercialisation of new sustainable solutions must be accelerated. The energy sector is amongst the most important ones since its relative emissions are high compared with other sectors. However, the sector is also known for its inertia and path dependences, which stem from high capital costs, long investment cycles, and vested interests. [1] Local energy systems (LES) are one proposed solution for the future. They enable more active participation in reducing emissions from customers by providing a platform for cooperation. This cooperation can include joint investments, sharing energy from local power plants, and creating optimal energy demand locally to avoid peak demands and, therefore, excess infrastructure build-out and use of carbon-heavy energy. However, LESs are still in a very nascent phase of development, and consequently, they are not well institutionalised.

The existing literature on the diffusion of LESs is relatively large. Many studies have looked at customer motivations and drivers for joining an LES (e.g. [2]–[4]). Also, the institutional preconditions, barriers, enablers, and change agents have been studied (e.g. [5]–[7]). Yet, there is less knowledge on how LESs are created in practice and what dynamics an LES creation process can include. Therefore, this case study aims to answer the research question: how the LES creation process takes place and what mechanisms can be distinguished in the creation process? We answer the research question by studying an LES project in Finland through the lens of social mechanisms [8] and the process of structuration [9]. Social mechanisms offer a standpoint that enables the articulation of the context and activities in the creation process. It can help to solve the "black boxes" in complex processes. Basically, it offers an alternative for research

approaches based on statistical associations and variables. In short, mechanisms aim to create a better understanding of processes and causality of events.

Our case study contributes to the literature on creating LESs with a new perspective involving mechanisms between stakeholders engaged in the creation process. It also contributes to the literature on entrepreneurial mechanisms by validating the use of social mechanisms in a case study handling the creation of a new entity. We highlight the multi-level nature of the creation process and the impact of meso-level mediating mechanisms between macro and micro-levels [9], [10].

II. LOCAL ENERGY SYSTEM CREATION PROCESS

There are several different concepts and definitions for LESs and other distributed energy systems [11]. Microgrid-term highlights the technical elements of local energy systems. They have clear physical boundaries that can function in both island mode and as a part of the larger grid. Their benefits range from local benefits like increased ability to operate absent electricity and gas infrastructure to macro benefits like providing frequency control reserves and offsetting grid investments of the network operator [12]. Environmental benefits and the ability to reduce reliance on energy imports are some of the more indirect benefits of microgrids in many parts of the world.

Besides technical and economic aspects, LESs have also been studied from social and institutional elements like community engagement, energy poverty, autonomy, and energy democracy. Within these spheres, there are several examples of different conceptualizations. Ref. [5] talks about local renewable energy organizations, which they define as "organizations, initiated and managed by actors from civil society, that aim to educate or facilitate people on efficient energy use, enable the collective procurement of renewable energy or technologies or actually provide (i.e. generate, treat or distribute), energy derived from renewable resources for consumption by inhabitants, participants or members". Berka and Creamer [13] use the concept of "Community-owned renewable energy projects", which they define as "developments which are wholly or partially owned and managed by constituted community organizations, established and operating across a geographically defined community". Authors in [14] use the concept of "local low-carbon energy initiatives", whereas authors in [15] use the concept of "distributed energy systems", which they define as "as units that convert and store energy and are located close to energy consumers". In this paper, we follow the characterization of [16], which highlights the smartness of LES, which enables local system balancing and network management by controlling different energy carriers (i.e. heat, gas, electricity),

and localness, which highlights local forms of operation, governance, ownership, and engagement.

A. Triggers

The founding process of LESs differs from conventional consumer-centered settings of supplying power in significant ways. LESs are initiated by public actors, private companies, or by citizen-led grassroots movements with different kinds of logics and goals [17]. As many energy community models are in the early development phases, initiators have agency on many different levels: individual, organizational and institutional [7]. The trigger for initiating an energy community project may be a new governmental policy, such as an energy innovation competition (e.g. case Samso island [18]). Municipalities can have a significant role in energy community emergence by having a monopoly for land-use planning. They have increasingly ambitious political targets for sustainability, which means stricter building standards for new housing development projects.[19]

Also, internal changes in an organization or a building may trigger the process. A need for building retrofitting, an introduction of electric vehicle chargers, and subsequent capacity issues or new energy-consuming investments, for example, can lead to installing community solar as a bundled offer. In any case, communities that already have a strong identity, shared social norms and trust, or established community groups [20] are more likely to initiate also LESs [6], [21].

B. Visioning

For getting potential members inboard, the community needs a clear vision for the future and active players who foster and maintain the vision against sceptics [22], [23]. The vision steers the scope and ambition level of the energy community [23], [24]. In LESs, which include businesses as customers, it is essential that an anchor organisation or entity takes this kind of leadership [22].

However, building a shared vision is not straightforward as different stakeholders can have different interests, values, and priorities. It is good to note that different LES types have very different value propositions [4], [25], [26]. For example, whereas other LES projects aim at energy independence, others may be content with lower levels of ambition [24]. Or, LES members may be okay with the provision of green energy on a non-profit basis, but banks and other stakeholders may not accept such starting point [27]. Finding a shared vision among citizens, companies, and politicians is essential, yet, we do not understand well how they crystallise in LES cases [23].

C. Planning

One of the main decisions to be made is on the governance model of the LES. Ostrom's principles in governing the commons are often used also as a backbone in the coop literature (e.g.[28], [29]). These principles of collective action problems include defining the governance boundaries, rules concerning the utilisation of resources, collective choice agreements, monitoring, graduated sanctions, conflict-resolution mechanisms, and self-organisation abilities [30]. Usual legal forms are cooperatives, which form the majority of existing LESs in Europe, yet include limited partnerships, non-profit customer-owned enterprises, and public-private partnerships are also possible [31].

The legal entity can develop its own rules according to what its members desire to get from the community. Even though one might get the impression that there are many existing frameworks for governing LESs, the rules are often done ad-hoc manner and figured out while the project develops [32]. The coordination of the planning process depends on whether the project is led by a professional project manager or by volunteers [21], [24], [32]. In municipality-led processes, the political process is also important, including ambitions and acceptance from the local council and implementation by the officers [23].

There are various financing mechanisms available, and the most common ones are loans, bonds and community member shares and sometimes donations. Typically, more extensive projects, such as wind power projects, use bank loans, whereas community shares can be used in smaller projects (e.g. rooftop solar for self-consumption).[33], [34]. Even though most expenses in renewable energy are typically capital costs, there are also operating costs, such as salaries and maintenance parts. A reasonable membership fee in the LES is, therefore, part of the LES's income [22]. Citizen financing also includes a less traditional form of financing, namely, crowdfunding, defined as a "joint voluntary effort by individuals, groups or organisations to pool their money together" [35]. Leasing can be an attractive financing model for those who need more time for raising funds [36]. The chosen financing mechanism also depends on the phase of the project [37], the aimed decision-making structure in the community, and the surrounding institutional context [38].

D. Co-creative formation

The planning phase proceeds to the actual formation of the LES. This includes investment activities and networking with the different stakeholders. [28] Investment decisions involve choosing contractors, which is one critical part of succeeding in LES projects. In ref. [20], a shared ownerships model experimented between the community members and companies, but building trust between these stakeholders' interests was challenging. Also, legal challenges can emerge along the implementation process, which must be answered even though the rules are not always clear and tested in practice [27].

Also, the formation should take a lifecycle perspective and design so that the use phase is carefully analysed and developed. In ref [39], lacking communications and education on system functioning, rules, configurations, ownership rights cause the LES administration to work unintendedly. Ref. [40] studied the implementation of LESs and noticed how data management especially created a new role, which no existing actor managed or took responsibility. They also found vulnerabilities in over-reliance on digital systems to solve complex social problems in case of institutional arrangements such as sharing the benefits and costs of the energy production.

III. EXPLAINING STRUCTURATION BY MECHANISMS

A. Social mechanisms

During the last decades, there has been a shift towards system-oriented studies that aim to tackle the complexities of natural and social phenomena [41]. Mechanisms are tools for analysis that lay between a description of events and universal laws [8]. Mechanism-based explanations are one way to "open

the black boxes" in complex issues: rather than asking why some phenomenon happens, the question is "how it happens?" This perspective is often compared to Humean models of causation, which are based on correlations between observed events. These Humean views have been criticised for not explaining the underlying powers producing causes and effects [42]. Also, creating such law-like regularities implies the perspective of closed systems, which does not suit our phenomenon [43]. Explanation by mechanisms has gained attention, especially after Machamer et al. [44] wrote their publication on the mechanisms approach on traditional philosophical issues in science.

Machamer et al [44] defined mechanisms as "entities and activities organized such that they are productive of regular changes from start or set-up to finish or termination conditions". In the literature stream based on critical realism. Bhaskar introduced the notion of generative mechanisms, which are enduring causal structures that produce observable events. They are tensions that work independently from the events they generate. Mechanisms exist even though they are not visible. Pawson and Tilley [45] noted that mechanisms are context-specific, usually hidden, and need to be discovered somehow, and they form outcomes in some way. Following [41], [42], there are several characteristics of what a mechanism is. Firstly, they are formed of functional components of entities and their activities. Secondly, they form a hierarchical structure. Thirdly, they aim to explain why and how a particular outcome was produced. Mechanisms are always for something and can be identified by the effect they produce. According to Bunge [46], mechanisms are processes that work as a part of some system. As a sociologist, he took as examples the price mechanism in a market and even democracy. In such examples, the mechanisms are conceived as a "process in a concrete system, natural or social". Talking of systems is more appropriate than just structures since the entities in the system are binding elements.

B. Bathtub framework for identifying social mechanisms

Coleman [47] proposed a simple framework for studying mechanisms in social sciences. In principle, the macro-macro-link can not explain the underlying causal forces, but they have to be explained via multi-level mechanisms. Therefore, the causal processes creating macro properties can be divided into macro-micro level interactions and there into three different mechanisms.

Firstly, the situational mechanism shows how the macro environment changes and creates stimuli for an individual's opportunities, goals, and beliefs. Here, the macro environment includes, for example, changes in infrastructure, politics, environment, or culture. Secondly, the action-formation mechanism shows how individuals' behaviour changes and how they generate actions. Actions are generated depending on the combination of individuals' desires, beliefs, action opportunities [8]. For instance, an action-formation mechanism can explain how an entrepreneur's risk-taking behaviour is encouraged by new perceived opportunities. Finally, the transformation mechanism shows how individuals jointly change the macro-level context and institutions. For instance, successful entrepreneurial ventures can lead to new tax policies that encourage even more activity in a certain field. [10] Usually, the bathtub model is used as a two-level framework, but adding a meso-level is sometimes practical and can reveal new insights. In our case, we follow [10] and

apply the meso-level for the case project, but it can also be seen as an organisation. The micro-level refers to local actions and macro-level to the institutional context.

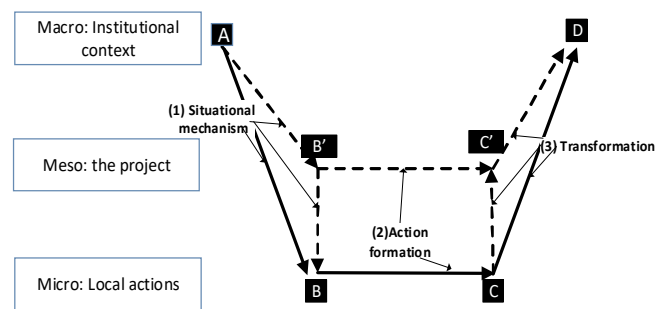


Figure 1. Multi-level causal mechanisms framework [10]

C. Mechanisms in structuration

The downside of applying the bathtub model is that it does not take time explicitly into account, even though it is clear that macro-micro-macro developments are dynamic and happen within longer periods of time.[48] Therefore, a relevant complement for the bathtub mode is the structuration theory, and the synthesis of these two theories by Barley and Tolbert [9] (see Fig. 2).[48]

With this framework, our case looks at the institutionalisation of new and altering social constructions. It refers to a process by which existing structures are questioned, and new alternatives are tested and embedded into society's norms, cognition and regulation. Institutionalisation processes are typically handled as a one-way process in which different stages flow in one direction [49], [50]. However, in most cases, the temporal dynamic is more complex and includes back-and-forth-steps in the process. Instead, an approach with a continuous feedback loop between macro and micro levels is more realistic (e.g. [51], [52]). Existing institutions are generally hard to break and resist change, which makes the institutionalisation process a tandem between legitimation of new and delegitimation of old institutions.

In the framework by Barley and Tolbert [9], institutionalisation was described as a recursive process between the institutional realm and individuals' actions. In their framework, the macro-meso mechanism was called "encoding", referring to how institutions are translated into scripts. Here, scripts work as intermediaries, which translate institutions to actions. Scripts are behavioural regularities and procedures that people prompt from past experiences and understandings. Scripts are then enacted in actions, which either retain or change the scripts. This includes moves and counter-moves by the new entrants and incumbents since deviating from existing rules benefits some more than others. Geels [53] calls these deviations and reproductions as structural elaboration. It is done through institutional entrepreneurship and often the help of field-level intermediaries like professional societies and industry associations, who evaluate and extract challenges and best practices. Once the scripts are done, they are externalised and objectified into the institutional realm. Externalisation means general acceptance and retention of the new structures and can be seen in new laws, standards, training manuals and handbooks [53], [54].

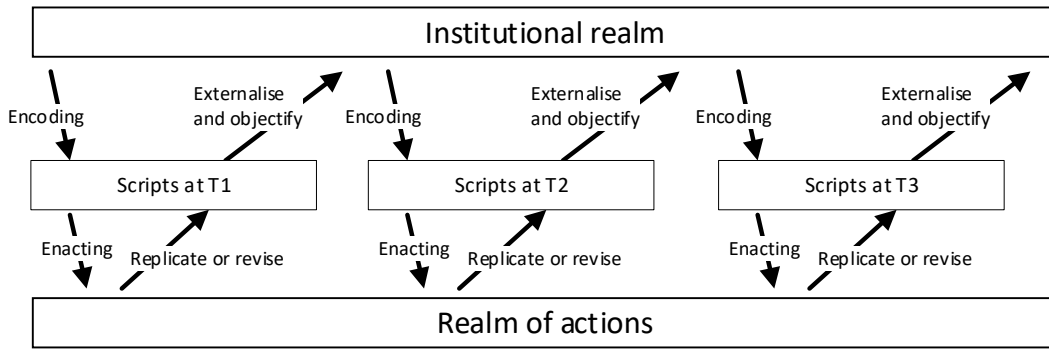


Figure 2. Recursive process of institutional change [10]

A complementing perspective for Barley and Tolbert's structuration process perspective on institutionalisation would be emergence-based institutionalisation. Both perspectives have been used by mechanistic explanations. [55] Instead of looking at top-down constraints and bottom-up attempts of change, it focuses on actions and social relations that produce changes that are more than one individual actor can predict or understand [55]. Acton et al. [56] note that emergent processes are characterised by their lower-level elements and how they are coordinated (why and how these elements function together). The hierarchical structure enables the system to change and self-organise by themselves if they have the properties to do so. Yet, emergence does not happen deterministically, which means that it does not follow a reductionist logic [57]. The definition of entities relies on the causal properties and relationships they build during the emergence. Padgett and Powell [58] created a mantra of this: "in the short run, actors create relations, in the long run, relations create actors." The duality of emergence means that there is both a structure and a process simultaneously, and they shape each other. "Patterns and properties emerge from the organization and interactions of lower-level parts but are not simply the aggregations of those lower-level components and properties" [59]. On the other hand, "a higher level emergent property, pattern or phenomenon causes, determines, regulates or influences lower-level properties and parts, either in those component entities or in their interactions"[59].

IV. METHODOLOGY

A. Case description

The case study is based on a LES project located in the southern part of Finland. The case LES project was initiated in 2016 and its construction ended in 2019. The initiator is a municipally owned utility, which sells district heat and gas to companies and citizens. The electric grid in the area is not operated by the utility but instead by a privately owned DSO (distribution system operator).

The case-LES aims at energy self-sufficiency, which means that it can serve its customers with its own power production if needed. Yet, it can also consume electricity from the public grid. Besides electric grid, it includes district heating and cooling networks and gas network. By combining different energy carriers, it can optimise operations economically and enable dynamic interplay between its customers. The LES includes 4 MW solar PV plants, 130 kW fuel cells, six gas motors, lithium-ion batteries and street lighting system functioning on direct current (DC). For aiding

in its economic investment, it received an approximately €5m grant from the Finnish government in 2017. However, in 2020, the national energy regulator denied the electric grid permit application, which implied that the plans of running an independent LES was not fulfilled.

B. Data collection

LESs are practically non-existing in the context of the Finnish energy system, nor have their regulation been set up until the case study project. In this sense, the research topic demands an exploratory approach. An abductive approach is chosen, emphasising rich data gathering. During the work, we reflected on the theoretical framework that would best suit the empirical findings. We used semi-structural interviews as a tool to discover the process of LES creation. The interview questions were adjusted to each interviewee but followed the order of 1. Initiation of the project or how the organisation joined the project, 2. Planning of the project, 3. Implementation of the project, 4. Commissioning and the future of LESs

We also participated in seminars where the project was introduced and discussed and gathered available secondary data, which included, for instance, news articles, advertisements of the project, and council meeting notes.

C. Data analysis

We followed the principles of process tracing in our analysis [60], [61]. There is an analogy to detective work as, in practice, it means combining activities to form a logical sequence. First task was the identification of events and entities, which was done by creating a timeline of the events on MS Visio with several iterative rounds. Each stakeholder's activities were marked on their own swimlane. Activities were connected by drawing lines between the participating entities in each activity. The main events of the project came up in the interviews as the interviewees went through their perceptions of the development of the project. This analysis was done by two researchers separately, and then the results were compared. Then we defined the "critical junctures", which refer to significant changes in the case context enabling new types of mechanisms to emerge. Second task was abductive recognition and reasoning of the mechanisms in the case study. Through several iterations of analysis, we concluded that the overall process is relevant to be described as structuration [9]. Within this overall picture, we applied concepts from a relatively wide range of organisation theories, including sensemaking, institutional theory and also

entrepreneurial studies. The results of our work were validated by two important actors in the case study project development.

V. RESULTS

Applying the Coleman's boat to our case, micro-level refers to the case actors' activities, meso-level to LES project's sub-processes and organizational structures, and macro-level to interactions with the institutional realm. Within the meso-micro section, individuals and organizations make sense and elaborate the formed and desired meso-level structures and processes and negotiate on choices based on different desires, values, and action opportunities. Within the meso-macro section, revisions of the institutional structures are either retained or neglected. The macro-level decisions affect the meso-level as institutional acceptance allows resource acquisition and neglect creates constraints for it. The case study can be divided into three cycles, which, in our case are defined as T1: ideation, T2: innovation and T3: future phases.

A. First cycle

1) *Situational mechanisms*

The first cycle starts with different macro-level changes. The first change was an increase in taxes on natural gas in Finland in 2010. The utility's business and assets depended on the gas infrastructure, and increasing taxes made them quickly less competitive. These changes created pressure on the utility to search for new strategic alternatives.

Simultaneously, the Nordic energy markets were heading towards the diffusion of renewable energy, which made especially electricity markets more volatile: wind power ate market share from existing power plants, which again reduced the amount of dispatchable power capacity in the system. This trend caused questions in incumbent industry actors, such as the municipal utility, but also national level grid operators, who were in charge of maintaining the grid balance.

A third situational mechanism was a new governmental project funding targeted for innovative energy projects. It generally covered 30% of project costs, which made their financing all the way more equitable. The existence of this scheme enabled innovating of new solutions instead of old models.

2) *Action-formation mechanisms*

The situational mechanisms triggered sensemaking in the utility by creating a surprising event, which had challenging consequences for the utility's future trajectory [62]. The acquainted actors in the gas sector saw natural gas as a "less bad" solution to coal, making it surprising that it got relatively larger tax increases. Also, the utility leader had a personal interest and ambition in developing the gas industry and especially fuel cells.

Another pattern in the action-formation mechanism was related to a new municipal strategy, which creation was initiated by a new municipal leader. Being a frontrunner in sustainable solutions and entrepreneurship was set as strategic principles, which gave premises for energy-related initiatives. Creation of a new municipal strategy started also cross-sectoral discussions between entrepreneurs, energy sector and urban planning. These discussions led to a plan of an energy self-sufficient LES for an industrial area.

3) *Transformation mechanism*

The idea of an LES was argued in the municipal council, which backed the idea with surprisingly strong political support. Then, important discussions were held between the utility and the local DSO, who operates the electric grid in the planned area for the LES. The area planned for the LES was primarily nascent, but a couple of companies situated there were already the DSO's customers. Moreover, the electric grid is a heavily regulated sector, operating in monopoly logic, which meant that incumbent companies had a strong foothold in the development of the field. Despite this, the utility suggested a hybrid model for governing the LES. The DSO, however, disagreed with the suggestion since it was against its interests and principles of running the grid monopoly. Consequently, this led to utility's idea of an independent LES.

The idea of an independent LES area was not tested legally before, but the project interpreted the legislation so that it was legal. However, as a whole, the LES project's properties suited the requirements of the governmental funding scheme. Some institutional work (i.e. lobbying) was done over the arguments for the LES between the Ministry choosing the granted project and the municipality.

B. Second cycle

1) *Situational mechanism*

The case LES project received governmental funding in early 2017, which also started a new cycle in its institutionalisation process. Overall, the grant made the project economically viable even though it included relatively expensive technologies, such as fuel cells, which were only on the verge of commercialisation in Finland at that time. The grant also gave the project external legitimacy because previously similar LES models had not been constructed in Finland. Although the governmental grant did not give the project regulatory legitimacy, it still provided normative legitimacy in the sense that such as project was seen as an exciting pilot to experiment. After the grant decision, the utility began the implementation, i.e., gathering technology partners and planning and scheduling the construction.

2) *Action-formation mechanisms*

The initiation of the implementation started sensemaking of the governance forms of the LES. The utility asked local entrepreneurs' opinions on how they see the LES delivering value to them. The utility analysed pricing mechanisms in cooperation with the local university. Legal forms were also pondered, especially from the perspective of how customers could engage in a responsive way to the LES idea. The utility aimed to create such responsiveness, for example, by sharing customers' excess heat from industrial processes with other members of the LES. Also, as technology providers were chosen, ideas on technology choices and opportunities were discussed and changed to the initial plan.

3) *Transformation mechanism*

The sensemaking and research on possible options led to decisions, which were in many cases dependent on each other due to technological interoperability issues. These choices lead to further formalisation [63], including contracts with technology providers, technical plans of the infrastructure, and meanwhile, also the communications with media and other stakeholders concretised the image and the brand of the LES. The utility marketed the LES for interested customers locally, and the technology providers for a global audience. The LES was an excellent reference for future sales work.

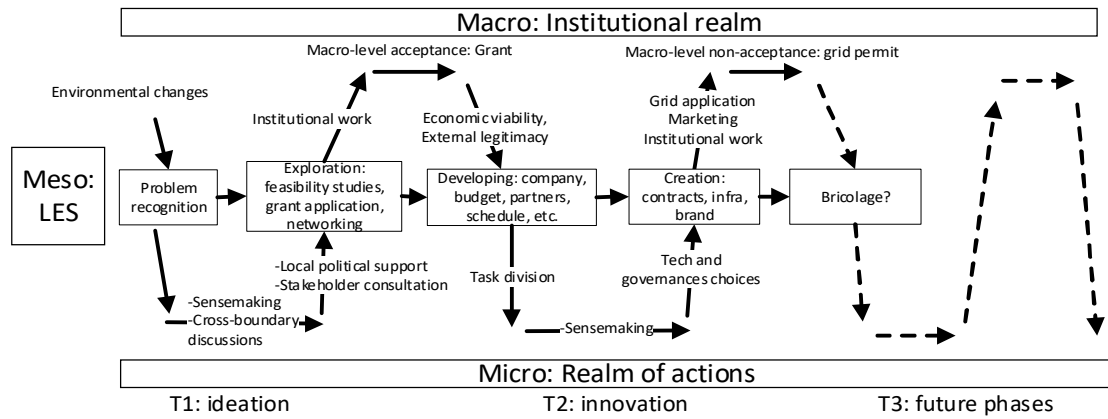


Figure 3. Structuration process of the LES project

The transformation mechanism included also the utility's aims to fulfill the legal requirements for operating its own electric grid. The team applied for the grid permit in the early phase, already in 2017, but due to different delays and questions from the regulator, the decision was made only in 2020. Between years 2017 and 2020, the general context was changing, and discussions started on allowing new kinds of LESs by EU-level directives. Especially the directive proposal on Local Energy Communities (later on Citizen Energy Communities) was used by the utility for arguing that the project would offer an excellent testbed for such structures. It included a notion that the legal option chosen by the utility for the case LES, (so-called Closed Distribution Network) could be a way to implement the directive in the EU member states. However, in 2020, the national energy regulator rejected the project's grid application as it interpreted that the project did not fulfill the requirements of the existing legislation, which again did not yet include the requirements of a closed distribution network.

C. Third cycle: Future steps

1) Bricolage and institutional work?

In this case, the regulator's rejection of the grid permit led to a new situation for the LES project. The next step arguably includes 'bricolage' mechanisms, which means "making do by applying combinations of resources already at hand to new problems and opportunities" [64]. In practice, this may require modifying the made business model concepts, investments, and infrastructure.

The upcoming cycle and how it continues from the bricolage remains to be seen, but some speculation can be done based on European-wide discussions and development. In general, there are many aspects in LESs that remain without definite best practices and dominant designs. These include geographical boundaries, tariffs, and legal forms [65]. Presumably, as more countries trial and implement different LES models, sooner or later, certain aspects of them get validated in other contexts and then more generally [66]. Bricolage work and consequent institutional work at this stage could therefore lead to models that would be replicated also in other countries.

VI. DISCUSSION AND CONCLUSIONS

This case study has shown how a groundbreaking LES project was initiated, developed, constructed, and ended up in

a halt. From the structuration perspective, it shows two cycles in a macro-micro-macro sequence, yet arguably these two cycles are only the first ones in a longer and continuing process. Overall, the process shows how a structuration process includes different mechanisms and their role in general development. First, situational mechanisms translated macro-level decisions and trends into individuals' beliefs, values, and goals. In our case, market trends, policy changes, and regulatory decisions created important junctures that were reacted differently on the micro-level. Action-formation mechanisms were, in this case, related to sensemaking, new social interactions among relevant actors, and boundary spanners, such as the new municipal leader in the initial discussions preparing the LES project. Transformation mechanisms, again, transferred these micro-level processes to grant and grid permit applications, marketing, contracts, and institutional work, arguing for more institutional support.

Compared to previous literature on LESs, the observed mechanisms have many similarities: environmental changes as situational mechanisms [18], local authorities' strategy implementation [19] and visioning [23], [67] as action-formation mechanisms; and local political support [7], creation of governance structures [28], and solving out incompatible rules on, e.g., grid connection rules [20], [27] as transformation mechanisms. Even though these similarities exist, our study notices the emergence of new roles, non-linearity of events and consequences and also highlights the connections between the mechanisms and how each mechanism's outcome leads to the next one. Mechanisms' dynamics on different levels help to understand further the process as a whole.

An optional way to analyse the process further could be by comparing the process literature on new venture processes [68]. Roughly, the usual steps in these processes were seen in the case study's meso-level (see Fig. 3). In the framework of structuration in [9], these intermediary level processes were labeled as scripts. By taking influence from the structuration model, our application of the meso-level adds dynamics of macro-level and micro-level activities and entities to the meso-level process. Arguably, this way of analysing also a new venture creation process adds value to practitioners, who need to evaluate the steps and activities on all levels: micro, meso and macro.

Creation of new kinds of organisations always includes uncertainties, as this case proved, and the structuration perspective can give a too straightforward perspective of the creation process. Therefore, the notion of emergence, including the creation of new roles, non-linearity, unintended consequences of social interactions, complements the structuration perspective. In the context of LESSs, this is particularly relevant, as they include new roles and activities, which no incumbent actor completely manages [40]. Also, our case showed how uncertainties exist on all levels and how their realization affects other levels dynamically. Therefore, future studies could, for instance, look more closely at the micro-level self-organisation mechanisms through ethnographic methods so that emergence dynamics could be researched as they happen.

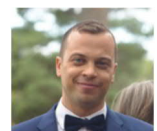
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