



Original research article

# The transformative power of self-organization: Towards a conceptual framework for understanding local energy initiatives in The Netherlands



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## ABSTRACT

Self-organization has been previously coined as a concept that describes the shifting relationships between citizen groups and institutional stakeholders in various fields, including sustainability and energy transitions. Yet, little has been known about what exactly the transformative power of self-organization is. The present article discusses processes of self-organization associated with small-scale, decentralized energy projects, such as local energy initiatives. By building on prior literature on energy initiatives, self-organization, and niche-regime interaction, attention is given to the mutually reinforcing relationship between local initiatives and the institutional context in which this relationship is situated. In analyzing the relationship between the internal aspects of the initiatives and their institutional arrangements, this article suggests that the processes of self-organization facilitate socio-institutional practices that are observable not only within the initiatives but also traceable in wider institutional contexts. These socio-institutional practices are essential for a better understanding of the interface between the citizen-driven energy projects and local governance. The analysis further supports the idea that processes of self-organization, along with market-led and state-led mechanism, underpin innovative and pragmatic pathways which could enhance the energy transition towards a carbon neutral future.

## 1. Introduction

An increasing amount of research in recent years has considered the role of small-scale, decentralized energy projects such as local energy initiatives (LEIs) and their transformative potential in the face of energy transition [1–4]. Local energy initiatives are often considered through the lens of local involvement and community ownership [1,5], grassroots innovations [2,6], citizen participation [7,8], individual motivations [9–11], consumer demand [12,13], and financial or legislative support mechanisms [7,14]. Despite its breadth and depth, however, limited clarity exists on the manner in which LEIs might assist energy transition. One point of entry to improve clarity is to highlight the processes of self-organization as essential to the understanding of the dynamic micro-level interactions between LEIs and the operational environment in which these are situated. Self-organization is often used to describe and analyze issues such as dynamic urban governance, the build-up of grassroots initiatives, and semi-informal or informal do-it-yourself initiatives [15–17]. In addition, self-organization plays a role in the institutional interplay between various local initiatives and local governance structures, which is also explicitly the case in debates on energy transitions [3,16]. Nevertheless, the exact nature of this interplay remains partly unclear.

This study argues that self-organization can provide an understanding of how socio-institutional changes occur both within the internal environment of the initiatives and the external institutional context (IC). For that reason, attention is focused on socio-institutional practices associated with LEIs. In this regard, socio-institutional practices refer to how “initiatives work” and more specifically to the “positions, roles, norms, and values lodged in particular types of social structures” [18]. While LEIs often have a strong local focus, the socio-institutional practices with which they are associated transcend the boundaries of their geographical scope. Following this train of thought, this article supports the view that self-organization is an ongoing process that takes place in reshaping the institutional framework of energy transition.

This article places processes of self-organization centrally to assess socio-institutional practices related to LEIs. The notion of transformative power associated with LEIs is, therefore, of critical importance. Hence, the central question in this research is as follows: while considering LEIs, what is self-organizing with reference to socio-institutional practices? Instead of assuming that only practices are self-organizing within the context of LEIs, this article pursues an inquiry on whether such self-organization should not also be placed at least partly outside of LEIs. If so, this could urge for a reconsideration of how we

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view LEIs in relation to the institutional transformation of the energy system, where LEIs are especially pertinent as triggers and engines of change. The aim is to generate a conceptual understanding of the role of self-organization in LEIs based on extensive field research covering 15 different community-driven energy initiatives. The results provide thought-provoking insights into the role of self-organization in LEIs and their IC placed within the broader discussion of energy transition.

This study contributes to a growing body of literature paying attention to the development and evolution of Dutch grassroots initiatives in the energy sector [19,20]. The empirical verdict presented here – input from local community energy initiatives found in the region of Groningen – are not representative of all Dutch subnational, but the findings serve as conceptual vignettes concerning how community-led developments initiate low carbon energy transition. This article, therefore, attempts to encapsulate the wider socio-institutional practices and suggest that these findings could have a broader context beyond the Netherlands.

The structure of the paper is as follows. The next section outlines the theoretical foundation of this research. Section 3 provides an account of the methods used in this investigation. Section 4 outlines the results of the field research. Section 5 discusses, compares and contrasts the main findings to earlier claims observed in the literature. Concluding remarks and suggestions for further research are presented in the final section.

## 2. Conceptual framework

### 2.1. Local energy initiatives

While this article discusses the relevance of socio-institutional practices associated with local energy initiatives, it has to be noted that a local energy initiative (*lokaal energie initiatief*) is a term used to describe any early-stage development of citizen-led decentralized energy projects in the Netherlands. The literature lists similar terms in various national contexts related to this topic such as “community renewable energy” or “community-owned means of energy production” in the United Kingdom [2,21]; “citizen energy” in Germany and Austria [8,22]; “citizen participation in the energy sector” in Germany [7,13]; and “renewable energy communities” in a larger European context [14,23]. The terms mentioned above are semantically and conceptually related. They all refer to the potential of grassroots initiatives that have a strong and conscious focus on energy related issues to practically change energy systems. In general terms, LEIs are a compilation of various types of societal actors in different institutional settings, united by multiple sets of objectives, which are not always related to energy [2,5].

LEIs are associated with small local level practices that are locally rooted but often struggle to achieve wider institutional and organizational impact in regional or local planning and development issues [5]. The emergence of LEIs is widely attributed to several factors. A majority of the relevant research connects LEIs with issues of community activism and grassroots mobilization [2,16,22,24]. Studies suggest [25–28] that LEIs rely on community action and are used as a tool for engaging in local collective action. The rising numbers of LEIs are associated with relatively high levels of social acceptance, support, and positive value linked to renewable energy amongst citizens at large [10,21,29,30]. It has been suggested that behind LEIs, there are often motivated individuals who have a shared vision and concrete goals that create opportunities to establish extensive networks [5,31,32]. Some authors [9,11] argue that partaking in local renewable initiatives often takes stock in gain- and norm-based incentives that motivate individuals. Others [13,33] underline that the effects of trust and multiple social relationships sponsoring individual and collective actions in facilitating LEIs cannot be ignored.

Understanding LEIs involve aspects that are external to the local community, such as the dependence or dissatisfaction with energy

suppliers [11,12]. Access to technological advances and the social value of such technological innovations provides [3,34,35] is also being considered. Another important external aspect refers to the quality offered by big service providers and the greater consumer demand for green energy [13]. Some authors [3,35] note that there is an alignment of interests between different societal and institutional stakeholders, which results in favorable preconditions regarding LEIs. The deployment of various legal opportunities, subsidies, loans, and other techno-economic modeling schemes for supporting LEI infrastructures are not to be ignored [7,14,34,36].

Sufficient attention should be paid to both the internal and the external aspects of LEIs to grasp the unfolding processes behind their various roles. LEIs face pressure not only in the context of local governance arrangements or the internal dynamics of the initiative but also in the interaction between these two aspects. Some authors suggest that LEIs highlight the role of networking, expectation management, and learning through social interactions between various societal actors [34]. Satterthwaite [37] and Dewulf et al. [38] suggest that the formation of LEIs also influences the institutional rearrangement that occurs between the involved organizational actors and the role of local communities. This line of argumentation suggests that attention should be focused on the interaction between the internal and external aspects, and how these aspects interrelate and influence each other.

### 2.2. Aspects of self-organization

Self-organization in planning is defined primarily through the lens of complexity theory and refers to the spontaneous and unpredictable changes mainly in an urban environment [15,39]. In practical terms, self-organization is associated with informal or semi-formal practices that concern different forms of collective action, social activism related to proactive civic engagement and eventually, build coalitions with local institutions [16,17,40]. Some studies [41,42] suggest that self-organization cannot be discussed without reference to the presence of an IC, which often strives to steer or even dominate such initiatives. To better understand self-organization, this article proposes that one needs to reimagine the internal and external aspects that influence processes of self-organization, how these aspects interact with one other, and what is the result of the output of such an interaction. It has been suggested [43,44] that processes of self-organization can intersect and challenge well-established planning practices and this could lead to different narratives, irrespective of whether these narratives are internal or external to the initiative's context.

If we seek to find out why self-organization is crucial for planning practice and how it contributes to our understanding of emerging local energy initiatives, we need to broaden our focus outside the aspects of self-organization, experienced at the scale of the local community. It seems that although self-organization is closely tied with the notion of local initiatives, what exactly is self-organizing is not stated outright. The remainder of this section provides a framework inspired by transition-thinking which aims to reduce some of the ambiguity surrounding the processes of self-organizing.

### 2.3. Self-organization in transition

In this study, transitions are defined as a process of change within a society or culture (including its physical and material artifacts) that is a result of the co-evolution of various processes and developments in different domains, resulting in multi-scale structuration [45]. Such structuration requires constantly reinforcing the interaction between nested hierarchies that consist of niches, regimes, and landscapes [46,47]. Throughout this article, LEIs refer to niche practices that reflect the surrounding sociocultural and material systems. The underlying assumption here is that niche practices can get upscaled and become new regimes or get incorporated into existing regimes. It might, however, be the case that dominant regime level practices can also

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