**The Future of Energy
funded projects**

Energy community ecosystem

Grenoble Ecole de Management (GEM)

Carine Sebi, Assistant Professor, Project Manager

Anne-Lorène Vernay, Assistant Professor

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Authors

Carine Sebi, Assistant Professor, Project Manager
Anne-Lorène Vernay, Assistant Professor

Grenoble Ecole de Management (GEM)
Univ Grenoble Alpes ComUE
12, rue Pierre Semard
38000 GRENOBLE, France
Main contact email: carine.sebi@grenoble-em.com

With the assistantship of Julien Doutre

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Executive summary

The power sector was historically designed as a strongly centralized and hierarchical system that was to be managed by central governments and large national state-owned mono or oligopolies. Various developments indicate that this situation is going to change and that citizen will play a more important role in the sector in the years to come. One way through which citizen can participate to the energy transition is by taking part in an energy community. Searching through the literature shows that there is not a unique and broadly accepted definition of what an energy community is. The first ambition of this study is to propose a typology based on two axes in order to embrace the diversity of initiatives that exist: i) whether the community has a citizen or public (like municipalities) governance, i.e. "citizen-centric" (which is the main focus of this study), or an initiative with private governance that targets the non-residential (e.g. C&I) or aggregated customers, i.e. "business centric"; ii) whether the energy community manages its grid or exchanges, i.e. "physical", or whether members or resources are geographically dispersed, shared and using existing national infrastructures, i.e. "virtual".

Citizen-centric energy communities are expected to have a central role to play in the energy transition and as such are attracting a lot of attention from policy makers. By drawing on domestic savings, citizen can contribute to financing decentralised renewable energy production through energy communities. This vow of independence implies the emergence of a new disruptive business model where social welfare is distributed and managed by citizens. It is also a way to increase citizen acceptance and mitigate resistance against new local infrastructure and technologies related to energy transition. However, energy communities led by citizens also face multiple barriers and their full potential is not exploited yet. Despite their

promise to contribute to the energy transition, the potential of energy communities is not fully realised yet and their future is uncertain. Their economic model is predominantly led by public policy such as the feed-in tariffs or other public incentives. They highly depend on their member's willingness to volunteer which present some drawbacks such as availabilities, professionalism, social and economic changes, etc.

Our literature review also reveals two gaps in the literature. First very little publication focused on the French context. Our in-depth study about the French context reveals that similar to their European counter parts, French energy communities face a number of technologic, financial, organizational, and legal barriers impeding their emergence and growth. We specifically observed that existing support scheme favour the development of large renewable energy project which may constraint the growth of energy communities, larger projects being more difficult to start with. Costs of grid connection is a central barrier, especially in more rural areas. Risk management and especially in the early project phases is an important barrier for energy communities. Similarly finding affordable insurance is problematic. Second, even though some scholars highlighted the importance of "inter-organisational" actions among cooperatives and the need for energy communities to coordinate their actions little is known about how this support is organized and structured. We argue that analysing how this support is structured would enrich our understanding of the challenges faced by energy communities in fulfilling their potential to contribute to the energy transition. This research stems from the observation that energy communities are rather vulnerable alone but that they can be robust collectively if they cooperate with the right actors. It compares French and Dutch energy community ecosystems with the aim to better understand how an ecosystem should be structured to support the emergence and growth of energy communities and ensure that they can transform the energy sector and empower citizens to take part in it.

We discuss the role played by keystone actors. It argues that keystones can help the ecosystem grow and induce change in the energy sector if they can become umbrellas for energy communities that are diverse in their mission and objectives. On the contrary, if they drive a co-evolution process that increases homogeneity, keystones may reduce the energy ecosystem to a niche, limiting its capacity to transform the energy sector. Then we argue that the capacity of energy communities to transform the energy sector also depends on how the ecosystem is structured locally. More specifically, it depends on the density of cooperative of communities and their capacity to sustain their activities over long periods. Cooperative of communities have a pivotal role to play as catalysers and we recommend designing institutional support so as to help these organizations be created and sustained over time. Third, transforming the sector requires changing the prevailing dominant logic to one that is more favourable to citizen engagement. The paper suggests that energy communities are more likely to induce change in the dominant logic if the energy community ecosystem both compete and develop symbiotic relation with incumbent. Competing with incumbent pushes them to innovate and better meet the needs of energy communities. Developing symbiotic relations can accelerate change and lead to the emergence of a virtuous cycle where actors co-evolve towards a novel logic.