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This paper must be cited as:

Cuesta-Fernández, I.; Belda-Miquel, S.; Calabuig Tormo, C. (2020). Challengers in energy transitions beyond renewable energy cooperatives: community-owned electricity distribution cooperatives in Spain. *Innovation The European Journal of Social Science Research*. 33(2):140-159. <https://doi.org/10.1080/13511610.2020.1732197>



The final publication is available at

<https://doi.org/10.1080/13511610.2020.1732197>

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Additional Information

Challengers in energy transitions beyond grassroots environmentalism: Community-based electricity cooperatives in the Valencia region

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Word count: 7,792 words (references & footnotes excluded)

ABSTRACT

As challengers to energy regimes grow in numbers and diversity, an interest in the coalitions that they are able to forge is also rising. Regrettably, the attention to challengers and their coalitions has rarely addressed those niches beyond grassroots organisations motivated by environmentalist concerns. In this paper we explore the attitudes of Spanish traditional, community-owned electricity distribution cooperatives toward the energy transition. To do so, we examine the case of the *Cooperativa Elèctrica d'Alginet*, in the Valencia region. Inspired by the Multi-Level Perspective on sociotechnical transitions, we explore the attitudes within this cooperative toward transformations in the landscape, the opportunities opened up by ongoing changes in the energy regime as well as toward the proximate niche of renewable electricity cooperatives. Our findings suggest an increasing alignment with the aims of the energy transition. This alignment is tangible in the distribution of renewable electricity, the increasing involvement in environmental awareness raising and the constitution of a common umbrella platform with the major Spanish renewable electricity cooperatives. The rapprochement between the cooperatives motivated by the local provision of affordable electricity and those prompted by environmental concerns hints to an emerging research agenda interested in the potential of cross-ideological political coalitions as a force of change in national energy transitions.

KEYWORDS

Energy transition; political coalitions; multi-level perspective; distribution cooperatives; Spain; Alginet

1. INTRODUCTION

A slow but relentless heating of the planet is our new normal. Perturbingly enough, however, the increase in 0.85 °C in global average temperature between 1880 and 2012 is but one manifestation of the ecological crisis. Equally unsettling are dwindling biodiversity, food insecurity, pollution or, more generally, the unbridled ecological footprint (Arias-Maldonado 2015). In response, in 2018 the *IPCC Special Report on Global Warming of 1.5 °C* called for ‘rapid and far-reaching’ transitions in land, energy, industry, buildings, transport, and cities to keep climate warming within a ‘safe’ warming interval. At the heart of the global ecological crisis is thus an urge for a transition toward clean, affordable and secure energy – the so-called ‘energy trilemma’ (Bridge et al. 2018; Heffron and McCauley 2017). Nationally-engineered energy transitions are being implemented to various lengths with an aim to transform the fossil present into a low-carbon future (Aklin and Urpelainen 2018). For instance, Germany has set upon itself the herculean task of attaining a 100 percent renewable energy mix by 2050. More broadly, the European Union aspires to coordinate its member states toward a EU-wide target of 32 percent of renewables by 2030.

In this shifting policy environment, opposite forces pull national energy transitions in diverging directions. Some incumbents, i.e. big national and transnational utilities, adopt strategies of entrenched resistance and ‘lock-in’ (Unruh 2000), including lobbying governments to minimise or even reverse pro-transitions efforts (Geels 2014; Hess 2014); whilst other incumbents seek to accommodate to the inevitable, but with the overall aim of maintaining their superior position (van der Vleuten and Högselius 2012; Kungl 2015). In the opposite end of the spectrum, grassroots environmental activists observe energy transition policies with scepticism, if not with overt opposition. Grassroots environmentalists deprecate the technocratic and reductionist focus on equivalent tonnes of CO₂ as the primary, if not unique, goal of energy transition policies (Huber 2015; Swyngedouw 2011). Somewhere in between, renewable profit-seeking businesses, decentralised renewable individual producers and community energy initiatives pursue their own projects of transition (Seyfang et al. 2014; Walker et al. 2010; Fuchs and Hinderer 2016; Bauwens, Gotchev, and Holstenkamp 2016). Prompted by a strong orientation toward environmental concerns, or by more prosaic purposes (Islar and Busch 2016), grassroots and civil society actors have in common an explicit position against powerful actors in energy systems, and a strong orientation towards a transformative energy transition. As challengers to energy regimes grow in numbers and diversity, the interest in how they form more solid coalitions is also growing. The study of

political coalitions (Hess 2014; Hess 2018), discursive coalitions (Bosman et al. 2014; Rosenbloom, Berton, and Meadowcroft 2016; Munoz et al. 2014) and advocacy coalitions (Markard, Suter, and Ingold 2016; Szarka 2010) is therefore attracting increasing academic attention.

The Spanish electricity sector offers a revealing perspective to the dynamics of inter-niche coalitions. One of its singularities is the weakness of community energy initiatives as found in other European countries (Vancea, Becker, and Kunze 2017; Romero-Rubio and de Andrés Díaz 2015). One remarkable exception, however, is the small but thriving niche of community-owned electricity distribution cooperatives that operate in the Valencia and Catalonia regions. Founded in the 1920s and 1930s to supply affordable electricity to undeserved localities, community-owned distribution cooperatives have experienced a resurgence since the mid-2000s. In the mid-2010s, for instance, most of them started to retail renewable electricity to their local customers. Even more interestingly, they took some steps to establish closer links with the niche of renewable electricity cooperatives created in the 2010s by the grassroots environmental movement.

Regrettably, community-owned electricity distribution cooperatives have received little attention in general, let alone from the literature on sociotechnical change in energy transitions. Whereas renewable energy cooperatives have started to draw the attention of a few scholars (Capellán-Pérez, Campos-Celador, and Terés-Zubiaga 2018; Heras-Saizarbitoria et al. 2018; Pellicer-Sifres et al. 2018; Riutort 2016), community-owned electricity distribution cooperatives remain to date largely off the academic radar. As a result, we know virtually nothing about the orientation toward the energy transition of what arguably constitutes not only the stronger niche of community energy initiatives in Spain but also a rich stream of opposition to the more powerful actors in the electricity sector. Also, we basically ignore their attitudes and strategies toward other niches of challengers to the electricity regime. This ignorance poses a major impediment to the study of coalitions of challengers in national energy transitions.

To redress this gap, in this paper we pose the following questions: what is the orientation of Spanish community-owned electricity distribution cooperatives toward the energy transition? How do they interact with grassroots organisations motivated by environmental concerns? What does the latter tell us about the emerging political coalitions between organisations moved by environmental and non-environmental concerns? To answer these questions, we concentrate our attention in one community-owned distribution cooperative, the *Cooperativa*

Elèctrica d'Alginet (CEA) in the Valencia region. To do so, we first present an overview of three niches that have emerged in Spain in the last two decades or so in the context of the energy transition. Second, we examine the singularities of community-owned electricity distribution cooperatives through the lens of one of its major examples, the *Cooperativa Elèctrica d'Alginet*. Inspired by the Multi-Level Perspective (MLP) (Geels 2011; Geels and Schot 2010; Geels 2002), we establish the credentials of CEA as part and parcel of a fourth niche of challengers to the Spanish electricity regime. To do so, we examine how CEA interprets the pressures of the landscape, i.e. the global ecological crisis; we explore in what ways CEA aspires to change the electricity regime in the new context created by the energy transition; and, finally, we scrutinise how CEA self-identifies itself as a challenger and its attitudes toward the challenges posed by other niches.

The paper is organised as follows. After this Introduction, in the next section we discuss the insights that the MLP can offer to scrutinise responses to the ecological crisis by niches of challengers. After that, we present our methods. From then on, we introduce and characterise three niches of challengers to the electricity regime that emerged in Spain from the early 2000s to the mid-2010s. This leads to our core discussion about the presence of a fourth, yet largely overlooked, niche of challengers: the community-owned electricity distribution cooperatives. This niche is explored in detail with the help of the case of the *Cooperativa Elèctrica d'Alginet*. We conclude by discussing the implications of our findings and suggesting some avenues for further scrutiny.

2. THE MULTILEVEL PERSPECTIVE: LANDSCAPE, REGIME AND NICHES

Socio-technical transitions literature offers a framework that focuses on the transformation of the key features of different systems of production and consumption such as food, transport, housing, finance or energy. It has been widely used to address and understand process of change within these systems (Smith 2007). Essentially, this literature is concerned with the characteristics and dimensions of systems and how the dynamics and processes change over time. The MLP framework has tried, within this literature, to organise the analysis of socio-technical change by considering that a socio-technical system consists of niches, regimes and landscapes (Geels 2010), and trying to offer a more complex and systemic approach to socio-technical change dynamics

From MLP, socio-technical configurations in regimes are stable and dominant ways of realising a particular societal function that is, they are dominant configurations of practices, relations,

discourses, etc. (Smith, Voß, and Grin 2010). According to Geels (2002) there are several dimensions that characterise a given regime: its guiding principles (i.e., the overall ideas and assumptions driving the system); the technologies used; the industrial structure (i.e., the relationships between stakeholders in production processes); user relations and channels to access goods and services (i.e., infrastructure, modalities and interactions for accessing); the policies and regulations (i.e., normative and legal aspects governing production, distribution and consumption); the forms and sources of knowledge used, produced and legitimised by the system; and the culture (i.e., social and cultural patterns).

However, a number of niches exist in a system. They are spaces in which alternative, less visible practices take place. These are protective spaces where different ideas, models, configurations and ways of doing try to survive and develop. Niches present configurations whose characteristics are different to those of the dominant regime: they may work with different guiding principles; may use different technologies; present different relations between stakeholders, channels and user practices; or may privilege different sources of knowledge and alternative cultures. Regimes are usually stable, whereas niches usually evolve quickly as they are spaces of permanent experimentation and change (Geels 2002). Niches are the place of transformative ideas and practices, but their potential is constrained or enabled through the more powerful structures of the regime (Bos and Grin 2008). Practices in niches may have very different attitudes regarding regimes (Geels and Schot 2007), so different kind of niche-regime interactions may take place. This may depend of the *landscape* and its pressures, on the stability of the regime, on the maturity of niches, but also of their views and strategies of niches. In this diversity of attitudes, niches may just try to *shield* and to *protect* themselves in a given regime; to *empower* themselves; and/or to *scale* by adapting to the regime or by conflicting, trying to eventually substitute it. Strategies vary from more adaptive and reformist to more contentious.

In the theory of socio-technical change of MLP (Geels 2010; Geels 2002), regimes try to survive and remain stable, but they are permanently exposed to pressures derived from external, powerful and long-term economic, social, cultural or environmental trends (Rotmans, Kemp, and van Asselt 2001), which constitute the *landscape*. Transition in systems may take place when the regime is destabilised because of the heavy pressure of the landscape, so windows of opportunity may be open for niches—if they are mature enough—to influence or even completely replace the regime (Geels 2002). As Smith et al. (2010, 441–42) see it, this framework “links specific innovation activities configured in niches with structural transformations in regimes”.

The MLP has generated helpful insights about the evolution, the trajectories and, more generally, the dynamics and regularities that govern low-carbon transitions (Geels et al. 2017; Verbong and Geels 2010; Scoones, Leach, and Newell 2015). Interestingly for our purposes, in the context of low-carbon transition in the United Kingdom the MLP has been employed to explore the transformative potential of niches of challengers driven by community values, not by environmentalism or even less the ambition to materialise an energy transition (Seyfang, Park, and Smith 2013; Seyfang et al. 2014). Others have looked at a similar phenomenon in Germany (Islar and Busch 2016; Becker, Kunze, and Vancea 2017). In this paper, we take cue from this stream of research by concentrating on those niches beyond grassroots environmentalism. In so doing, we concur with some authors who invite us to interrogate regime-niche dynamics by drawing on the visions and motivations of the actors and their interactions with the visions and activities of others, instead of relying upon prefixed classifications (Köhrsen 2018). These interrogations may help to unveil how challengers beyond the more militant and contentious grassroots energy environmentalists promote alternative practices and spur the growth of distinct niches of challengers. They may not be directly denouncing the model or the powerful actors, nor fully reframing the idea of energy transition. They may be newcomers or old and well-established stakeholders, but at any rate they aspire to change the electricity regime in response to transformations in energy landscape. But, at any rate, they are also developing practices beyond the mainstream. As we will see, in the Spanish low-carbon transition challengers have emerged in the forms of renewable profit-seeking businesses, decentralised on-grid producers, renewable electricity cooperatives and, somewhat unexpectedly, community energy initiatives.

Therefore, the MLP may be relevant for understanding dynamics of change, but it may be problematic for understanding the why and the how of the complex relations that a specific stakeholder or practice establish with other niche practices, in front of regimes, and in the context of landscape pressures. Bridging this gap is of key importance if we want to understand the differences between the actions and strategies of different stakeholders in niches, process of energy transition.

3. METHODS

Our analysis is premised on the purposeful selection of one case within the population of twenty-one community-owned electricity distribution cooperatives in Spain. Although non-representative of the whole population, our purposive choice is helpful to illustrate some of its

features. This is so for two reasons: first, our case study shares the basic characteristics of all community-owned electricity distribution cooperatives in Spain. Second, our case study deals with one of the most innovative distribution cooperatives, and is therefore illustrative of those distribution cooperatives in Spain which have progressed further in reaction to the transformations induced by the ecological crisis. The deliberate selection of one case study is acceptable given the objective of exploring an information-rich case and the absence of any claim to representativeness of the wider population of distribution cooperatives (Yin 1994). Furthermore, the choice of a unique case study was determined by time, logistical and, especially, budgetary constraints. The selection of CEA also responded to the stratification of the population of twenty-one distribution cooperatives in Spain. Thus, *Enercoop* and CEA are by far the largest cooperatives in number of customers (approx. 14,000 and 6,000 affiliates, respectively), as well as the only ones which have customers beyond its original local demarcation and have participated in innovation projects in the European Union. Against this background, CEA was picked based on its frontrunner status amidst the rest of cooperative in two domains: innovation projects and community outreach. In this regard, the advantages of CEA are a balanced combination of business and social orientation, as well as the existence of a clear-cut organisational renaissance in the early 2000s which coincided with the initial steps of the energy transition in Spain. We started our study by identifying the different niches of challengers in the Spanish energy transition in Spain. To that end we drew on the available literature as well as on media reports. The exercise was halted when we reached data saturation on the main features of each niche.

As far as CEA is concerned, our study draws primarily on individual and group interviews with a total of 16 informants. We interviewed eight informants from CEA: three members of the board, including the sitting President; three members of the executive team, namely the Managing Director, the Technical Director and the manager of innovation projects; and two additional members of staff, namely one staff from the commercial department, and one member of the intervention and repairs team. One goal of these objectives was to identify milestones in CEA's business and social outreach strategies. Accordingly, we opted to carry out this exercise with those informants who have worked for CEA since longer. This allows us to draw on the contrast between the present and the trajectory of CEA before the 2000s. We jointly constructed a timeline of events starting in the early 2000s, covering two dimensions: breakthroughs in the business model and in social outreach practices. Additionally, we conducted four individual interviews with external informants cognisant of the activities of CEA. These informants worked for the local council, a supra-municipal energy agency set up by

the local councils in the area, as well as for the largest agricultural cooperative in Alginet. The fourth informant was a member of staff of the umbrella organisation representing the interests of the electricity distribution cooperatives in the Valencia region. The aim of these four interviews was twofold: to contrast the information provided by informants from CEA, as well as to gather data about the context in which CEA operates. Lastly, we also held a group interview with a panel of four representatives of small and medium-sized electricity distribution cooperatives (all smaller than CEA). Overall, we interviewed eleven male and five female informants. All interviews were carried out between December 2017 and April 2018.

Our choice of informants, particularly within CEA, was based on two criteria: diversity of positions within the cooperative and data saturation. Out of a total universe of approximately 30 members of staff, we set ourselves the goal of interviewing between 6 and 12 informants. Informants were identified with the help of two members of staff of CEA, who acted both as our gatekeepers and central nodes in our exercise of reference sampling. As a consequence, the voices of members of staff and board members of CEA may be slightly over-represented in our non-representative sample, and critical voices with the recent strategy of the cooperative equally under-represented or even silenced. Given the scope of the research, it was not feasible to expand the scope of informants. However, the interviews, our own observation, as well as the interviews held with informants external to CEA, do not suggest to us the existence of a distinct body of opinion contrary or substantially divergent to the views and facts presented to us by the staff of CEA interviewed.

4. THE CONSOLIDATION OF THREE NEW NICHE OF CHALLENGERS IN THE SPANISH ENERGY TRANSITION, 2000-2018

In this section we present a brief overview of three niches of challengers that coalesced in Spain between 2004 and 2018: a) small and medium-sized renewable profit-seeking businesses; b) decentralised on-grid producers and a mass of approximately 55,000 individual investors in solar farms (figure produced by ANPIER, see below); and c) the niche of grassroots renewable energy cooperatives. This overview of the consolidation of three niches of challengers provides the background to our core discussion in the next section about what we consider a fourth, yet largely overlooked, niche of challengers: community-owned, traditional electricity distribution cooperatives. Albeit necessarily brief and incomplete, the account presented in this section presents the strategies that the three niches pursued to affirm themselves in opposition to the traditional hegemony of the five largest electric utilities in

Spain, namely *Endesa, Iberdrola, Gas Natural Fenosa, Energias de Portugal Hidrocantábrico* and *Viesgo* (Garrués-Irurzun 2010).

The first two niches, i.e. renewable profit-seeking businesses and decentralised on-grid producers, gained strength in the 2000-2010 period (the 'glorious decade of renewables'). Both blossomed thanks to the support to renewables enshrined in feed-in tariffs. Thanks to the incentives, large-scale wind parks (up to 50 MWs) and the solar industry thrived in the 2000s. By 2008 Spain was the largest solar market worldwide, and a world leader in concentrated solar power technologies. Spain jumped from 45 photovoltaic installations registered by 2000 to more than 51,000 by 2008. In the same period, domestic production of photovoltaic products grew from €72 to €645 million, and imports from €34 to €5,400 million (del Río and Mir-Artigues 2014). The 400 MW target set by the government for 2005 was exceeded by a factor of almost ten (Gómez, Dopazo, and Fueyo 2016). Overall, the glorious decade between 2000 and 2010 was marked by the slow progression towards a 'stretch-and-transform' pathway of transition (Geels et al. 2016; Geels and Schot 2007). Even so, by late 2014 the five largest electric utilities still supplied electricity to a total of 28.8 million delivery points, respectively (Sánchez-Ortiz et al. 2018).

The first niche of renewable profit-seeking businesses found an organisational expression in the foundation of sectoral interest groups. The *Asociación de la Industria Fotovoltaica* (ASIF) was established in 1998; *Asociación Empresarial Eólica* (AEE) in 2002; *Asociación Empresarial de Industria Solar Termoeléctrica* (PROTERMOSOLAR) in 2004; and *Asociación Empresarial Fotovoltaica* (AEF) in 2008. This niche of renewable profit-seeking businesses thrived in part thanks to its ability to attract funds for large-scale solar farms from a variety of sources: pension and investment funds, real estate investors, national and international banks and domestic middle-class small investors. In total, investments in photovoltaic facilities in Spain amounted to €20 billion (Álvarez-Díaz, Fernández-González, and Caballero 2017). By contrast, the second niche was constituted by decentralised, mostly solar, producers who sold electricity to the national grid at a strongly subsidised tariff. Some amongst them also invested in medium-sized solar farms (Romero-Rubio and de Andrés Díaz 2015).

The scope of incentives to renewables soon turned into a furious policy dispute over the degree of ambition of the energy transition (Haas 2018). This discussion paved the way for a policy U-turn that re-embarked the Spanish energy transition upon a 'fit-and-conform' pathway (Geels et al. 2016; Geels and Schot 2007). At the centre of the controversy was the scale of the financial incentives to renewables. Only in 2013, incentives to renewables cost the

Spanish Treasury 6.8 billion, or approximately 0.7 percent of GDP (AEVAL 2011; OECD and IEA 2015). The ‘tariff deficit’, i.e. the alleged difference between the regulated costs of the power sector and the fees charged by the utilities, amounted by the end of 2015 to the staggering figure of 25 billion euros (CNMC 2016), partially as a result of the liberal incentives to renewables. Even though the available evidence tends to suggest a net positive effect of renewables (Ciarreta, Espinosa, and Pizarro-Irizar 2014), the incumbents, hand in hand with the conservative government in office since November 2011, mobilised the argument of the tariff deficit in favour of repealing the feed-in tariffs. In any case, the drastic ‘policy backlash’ (continued until mid-2018, when a new centre-left socialist government won office) included retroactive reductions in the rate of return to existing renewable facilities which reduced to nil the number of new projects by 2013 (see figures 1 and 2).

But the policy controversy in the late 2000s also involved other contentious issues. Two of them were disparate understandings about renewable technologies and the ultimate goal of the energy transition. Thus, the big incumbents questioned whether certain technologies, especially photovoltaic solar, could be regarded as reliable and mature enough. The big five utilities, which had enthusiastically invested in onshore wind farms and, crucially, natural gas (Gómez, Dopazo, and Fueyo 2016), were considerably more reluctant toward photovoltaic and thermoelectric solar. Arguably, their reluctance was related to the fact that both segments were operated by a diversity of small and medium-sized businesses and financed thanks to an amalgam of big international funds and domestic individual middle-class investors (Stenzel and Frenzel 2008; Szarka 2010; Ratinen and Lund 2014). Incumbents also argued strongly in favour of nuclear energy (exclusively operated by *Endesa*, *Iberdrola* and *Gas Natural Fenosa*), a message conveniently echoed by the media (Mercado-Sáez, Marco-Crespo, and Álvarez-Villa 2018). More generally, the incumbent utilities understood the energy transition as a process of maximizing renewables as a share of primary energy consumption. By expressing their opposition to renewable incentives whilst also narrowing down sustainability to climate change, Spanish incumbents aligned themselves with analogue trends by European transnational electric utilities (Haas 2019).

Insert Figure 1: Installed wind power capacity in Spain, 2000-2016. Source: IDAE.¹

Insert Figure 2: Installed solar PV and thermoelectric capacity in Spain, 2000-2016. Source: IDAE (see figure 1).

The policy U-turn of the late 2000s inaugurated a fresh cycle of contention over energy issues to a scale unseen in Spain since the mid-1980s. The politicisation of energy confronted two projects: on the one hand, the ‘grey’ hegemonic project of the incumbent utilities, oriented toward preserving existing hegemonies and cashing in on capital already invested in fossil and nuclear facilities; and, on the other hand, the ‘green’ project of environmentalists and renewable energy cooperatives, intent on safeguarding some policy space for renewables and on weaving alliances with social movements to countervail the policy offensive (Haas 2018; Haas 2019). Thus, in this second period, 2010-2018, grassroots energy environmentalist organisations became very active. In parallel to a diversity of forms of protest, grassroots energy environmentalists from various regions independently set up renewable cooperatives to retail electricity. In Catalonia, the renewable electricity cooperative *Som Energia* was established in 2010, reaching 50,000 affiliates and 80,000 customers by mid-2018. In the Basque Country *Goiener* was created in 2012 (9,000 affiliates and 11,000 customers by mid-2018). This niche succeeded in sensitising ample sections of the population over the urgency to address fuel poverty, but also over complicated issues such as the very existence of a tariff deficit (Franquesa 2014). On the political contention front, grassroots energy environmentalists joined forces with political parties in the left (*Podemos*, *Izquierda Unida*) and centre-left (*Partido Socialista Obrero Español*, PSOE), as well as with a variety of anti-austerity social movements and, crucially, and the two other niches of challengers (solar investors and renewables businesses). A common argument was the denunciation of the ‘oligopoly’ of the five largest electric utilities, invariably portrayed as a cartel for promoting vested interests and non-democratically dictating energy policies to Spanish governments (Haas 2019). To that end, new platforms of pro-renewable activists (*Plataforma por un Nuevo Modelo Energético - Px1NME*, *Fundación Renovables*, *Observatorio Crítico de la Energía*, *Xarxa per la Sobirania Energètica*, *Aliança Contra la Pobresa Energètica*) adopted similar discursive strategies to those of the umbrella bodies representing the interests of renewable industrialists and middle-class investors (APPA, PROTERMOSOLAR, ANPIER). Grassroots energy environmentalists and renewable energy cooperatives, however, went farther. *Som Energia* and *Goiener*, Px1NME and well-established environmental organisations such as Greenpeace or *Ecologistas en Acción*

overtly advocated for a ‘more-than-fuel’ energy transition, including the de-commodification of energy (energy conceptualised as a commons), more participation of citizens in the energy system (energy democracy) and the adoption of off-grid and smart grid architectures (self-generation) (Capellán-Pérez, Campos-Celador, and Terés-Zubiaga 2018; Pellicer-Sifres et al. 2018; Heras-Saizarbitoria et al. 2018; Riutort 2016).

From 2004 through 2018, energy transition policies resulted in the quantitative but also qualitative expansion of three niches of challengers. The glorious decade of renewables and the subsequent policy backlash were observed with attention by different actors. Key amongst them is the Spanish community energy sector. As already noted, community energy in Spain has received far less attention than its historical importance calls for. In part, this reflects a national singularity. Community energy has found it difficult to establish firm roots in Spain (Romero-Rubio and de Andrés Díaz 2015), at least not in the organisational forms present in other European countries (Vancea, Becker, and Kunze 2017). However, Spain does host a small but thriving niche of traditional, community-owned electricity distribution cooperatives. Against the background of the three niches presented in this section, in the next one we characterise the trajectory of these cooperatives and scrutinise their credentials as a fourth niche of challengers. We concentrate on their evolution from the mid-2000s through the mid-2010s, as well as their attitudes towards the landscape, the regime and the new niches of challengers. To do so we explore in detail the case of *Cooperativa Elèctrica d’Alginet* in the Valencia region.

5. A FOURTH NICHE OF CHALLENGERS? THE CASE OF COOPERATIVA ELÈCTRICA D’ALGINET

The *Cooperativa Elèctrica d’Alginet* (Valencia region, population 13,000) distributes and retails electricity to approximately 6,000 local customers as well as to a limited number of regional public bodies. The origins of CEA can be traced back to 1929, when a few local notables and entrepreneurs mustered the capital required to connect Alginet to a nearby electric line. Alginet did as other localities in the Valencia region, such as Castellar, Callosa de Segura, Chera, Crevillent, Guadassuar, Meliana, Torrent or Vinalesa (Eléctrica Meliana 1998; Giménez Guarinos et al. 2011; Federación de Cooperativas Eléctricas de la Comunidad Valenciana 1992). In these localities, economic activity was dominated by agriculture. Short of industries, Alginet was therefore uninviting for the private utilities that in the early 20th century slowly extended their grids across the Valencia region. Even today, agriculture accounts for 25 percent of all

economic production in Alginet. Despite that, CEA has managed to grow quite considerably in turnover and staff over the last decade, to the point that it has seen a growth in workforce from seven to thirty in that period. This growth has gone hand in hand with an expansion from conventional business segments toward generation and telecommunications in Alginet.

CEA is one of the sixteen electricity distribution cooperatives operating in the Valencia region since the mid-20th century. In terms of customer base CEA is only second to *Enercoop*. *Enercoop* was founded in 1925 in Crevillent (Alicante) to contribute to the technological renovation of a thriving textile industry in the area. More recently, *Enercoop* not only consolidated its activities, but also embarked upon a path of considerable growth, to the extent of making some inroad into the German and Portuguese generation and retail markets in the early 2010s. Apart from CEA and *Enercoop*, the remaining fourteen electricity distribution cooperatives are smaller in size, with the more modest amongst them supplying only a few dozens of customers.

For CEA and the rest of electricity distribution cooperatives, the liberalisation of the Spanish electric sector in 1997 opened up fresh opportunities. Indeed, CEA's business and social outreach activities spurred over the last fifteen years. Throughout this period the main purpose of CEA continued to be the delivery of low-priced electricity to the households, commerce and industries in Alginet. This is in line with the foundational aim of contributing to the welfare and economic development of the locality. But at the same time the original purpose expanded in new directions, especially toward the provision of social benefits to the community, the diffusion of environmental values and the supply of renewable electricity. CEA also made genuine attempts to increase the participation of its affiliates (see below).

A new Board, elected in 2004, brought about an injection of fresh ideas to CEA. The new Board members were motivated by the aspiration to attain higher levels of affiliates' participation and to expand the activities of the cooperative beyond the mere supply of low-priced electricity. The new Board focused upon two lines of action: on the one hand, to improve the quality of electric supply and, more broadly, of the services offered by the cooperative to its customers; on the other hand, to strengthen the programme of subsidies and grants to a range of social groups in Alginet, especially those most seriously affected by the economic crisis that broke off in 2008. Thereby, the first breakthrough came from the aspiration to find a lasting solution to the recurrent restrictions in the supply of power established by *Iberdrola*. A powerful adversary, *Iberdrola* is the second largest private utility in Spain according to the number of contracts (according to data from *Comisión Nacional del Mercado de la*

Competencia, the market regulator). *Iberdrola* also owns and operates as a monopoly the regional distribution grid from which CEA obtained the electricity. Recurrent restrictions in the amount of power delivered by *Iberdrola* resulted in blackouts and restrictions in load-shedding exercises for CEA's customers. As a result, by 2007 CEA had filed 25 lawsuits against *Iberdrola*.

The new Board set the ground for a series of breakthroughs in the business model. The first one, started in the mid-2000s, was the construction of an electric substation. The substation, finalised in 2012, allowed CEA to bypass *Iberdrola* and connect Alginet to the semi-public national grid. This move not only improved the quality of supply to customers in Alginet; it also earned CEA an almost complete independence from a fierce competitor. A second breakthrough in the business model occurred in 2008 thanks to the complete rollout of smart meters across the entire CEA grid. The rollout was completed ten years ahead of the deadline set by the authorities for the whole of Spain. Once deployed, smart meters revolutionised the billing process. Costs dropped, and several sources for human error were eradicated: human readings, estimated bills and discrepancies between customer and CEA concerning impromptu lofty bills. Also, the information about consumption supplied by the smart meters allowed CEA to offer better advisory services, especially as energy efficiency is concerned. This became particularly important once instances of fuel poverty increased considerably after 2008. Suddenly, the early and successful deployment of smart meters put CEA under the radar of a number of technological partners interested in implementing pilot projects on the management of smart grids. In particular, the Spanish technological transnational ETRA invited CEA in the early 2010s to participate in two Europe-wide projects: Nobel Grid and Hyrim.ⁱⁱ Besides helping CEA to acquire cutting-edge technical know-how, both projects also raised its visibility vis-à-vis key Spanish and European actors in the power sector, including policymakers, and facilitated new technological alliances. At the same time, these projects also boosted CEA's visibility and prestige in Alginet, given the notoriety achieved in the local media. Accordingly, a third breakthrough resulted from the participation since 2011 in various technological innovation projects (NobelGrid and Hyrim, since 2011). In those projects, CEA provided a testbed for the management of smart grids. The last of these projects, Nobel GRID, yielded the design of an open-code smart meter intended to support distributed renewable generation, energy efficiency, electric vehicle recharge, and other measures intended to fight climate change. Last but not least, 2015 brought the shift to retailing electricity certified from renewable sources.

As far as social outreach is concerned, the new Board soon increased the range and amount of grants and subsidies toward social groups in Alginet. Such allowances had traditionally focused

on social and sport clubs. Soon, other organisations started to receive financial assistance from CEA, including music clubs, a local festivity group (*Fallas*), the Holy Easter brotherhoods, but also local writers who experienced difficulties in seeing their works published. In 2005, CEA started to subsidise more generously the 'day of the electric cooperative' with the occasion of the local festivities; in 2008, a discount for those already retired was set up; in 2011, CEA inaugurated a programme that subsidises primary and secondary school textbooks as well as the expenses involved in end-of-course trips; in 2013, it instituted a food subsidy for the neediest; and in 2016 it started to sponsor a 'cooperative village' in India. All these subsidies were met with warm approval by the affiliates and the population of Alginet. Affiliates began to show an earnest interest in the calendar and modalities of delivery of the subsidies. These programmes were set up with the goal of ensuring that no one in the community was left behind, particularly given the scale and depth of the economic crisis. The allowances were designed to ensure that beneficiaries would spend the amount involved in the largest possible number of local shops, thus boosting the local economy.

All of the former invites us to explore the credentials of CEA as part and parcel of a niche of challengers to the Spanish electricity regime. Accordingly, in the three sub-sections that follow we undertake that exploration with the analytical assistance of the Multi-Level Perspective (MLP). We pay attention in particular to the three central concepts of landscape, regime and niche. Thus, we examine how CEA interprets the pressures of the landscape, i.e. the global ecological crisis; we explore in what ways CEA reads the evolution of the electricity regime as a result, inter alia, of the energy transition; and, finally, we scrutinise how CEA self-identifies itself as a challenger and its attitudes toward the challenges posed by other niches.

5.1. Interpreting the landscape: How CEA reads opportunities and limits opened by environmental crisis and pressures for regime change

In terms of how CEA reads the new landscape, its recent trajectory expresses a concern with energy efficiency and, to a much lesser extent, renewable generation. The environmental diagnosis shared by staff and the board members implies that the central issue for contemporary societies face is the depletion of resources due to over-consumption. The attendant solution calls for different actors to increase the environmental awareness of the population in two directions: more efficient uses of energy and the attenuation of the negative impacts of electricity generation by means of a long-term, complete shift to renewables. Over the last years, CEA has sought to promote environmental awareness on energy efficiency and

the advantages of renewable energies. Thereby, in the early 2010s CEA launched a campaign against 'energy vampires' to incentivise the substitution of inefficient domestic appliances, stand-by consumption and other idle sources of consumption. CEA also encouraged and delivered demonstrative workshops in schools and social gatherings. By contrast, as far as renewables are concerned, the recent trajectory of CEA has only incorporated that aspect very recently through a project launched in late 2017 to build a photovoltaic plant in the terrains of the substation. Indeed, this project was conceived more as a project of environmental awareness than in terms of its contribution to the cooperative's generation mix. Despite the self-stated commitment to renewable production amongst CEA staff and the Board, more photovoltaic projects failed to materialise due to their insufficient financial returns. Thus, the growth of environmental awareness within CEA owes to the growing exposition to European and Spanish renewable energy initiatives instigated by the energy environmentalism movement (and instantiated by means of Europe-wide innovation projects and the newly born *Unión Renovables*). Overall, however, actions in favour of environmental sustainability have permeated only partially the core business of CEA, even when the shift to supplying renewable electricity is considered. At any rate, the growing environmental awareness has remained secondary to the original purpose of delivering access to affordable electricity for the community. The main challenge diagnosed by CEA continues to be the unfairness of the electricity regime (see below) and, only secondarily, the unsustainability of the electricity regime. The actions toward increasing environmental awareness in the local community aim to improve environmental attitudes and uses of energy, and only to a lesser extent to provide business services to customers that allow them to shift to more transformative patterns of electricity consumption.

5.2. Interpreting the evolution of the electricity system: how CEA reads changes in the regime

As already noted, CEA's major concern with the Spanish electricity regime is its unfairness vis-à-vis electricity distribution cooperatives. For CEA, however, the unfair treatment of electricity distribution cooperatives is not the result of discriminatory policies. Rather, it stems from the imposition of the same requirements to organisations of a very diverse nature. Thus, Spanish regulations impose the same exigences on financial and information aspects to electricity distribution cooperatives and the big five distribution utilities. For example, CEA staff repeatedly mention that before 2007 the regulatory framework mandated electric

cooperatives to register in the Commercial Register, which according to Spanish law can only register private companies. For CEA this de facto asymmetry not only overlooks the sheer difference in the size of the customer base (thousands versus millions). It also disavows the crucial fact that until 1997 the big five distribution utilities operated as state-sanctioned regional monopolies. The privileged market status of the dominant incumbents today is a carryover of their privileged position in the past. Closely connected to the accusation of unfairness is the idea that the legal architecture of the Spanish electricity system results from unequal access and, ultimately, regulatory capture by the hegemonic incumbents. CEA's top staff therefore also complain about their lack of interlocution with the highest echelons of policymakers in the central government.

The former does not lead CEA to disregard the major transformations underway as a result of the energy transition. CEA staff is deeply convinced about the inevitability of a 100 percent renewable electricity mix in the near future. Moreover, CEA staff also imagine a not so distant future distribution grid in which the national grid will co-exist with decentralised smart grids, electric vehicles and smart electric appliances in households. In this future regime scenario, CEA staff envision considerable opportunities for local, community-based electricity distribution cooperatives, given the fact that they own and operate the local distribution grid. Still, the transition to this new scenario is expected to take decades. More crucially, the core aim of CEA in this new scenario is considered to remain within the remit of providing affordable electricity to the local community(ies).

5.3. Interacting with other niches of challengers: how CEA sees other stakeholders aspiring to a transformative energy transition

CEA staff observe with sympathy the efforts of challengers in favour of a greener and more democratic electricity regime. Above all, they have a positive attitude towards those actors which abide by the principles of the social economy, i.e. the renewable electricity cooperatives. A general observation is that against the magnitude of the sustainability crisis CEA staff deem all efforts as positive.

At the same time, CEA staff also acknowledge the relevant differences with renewable energy cooperatives. Firstly, whilst the latter are moved by the explicit aspiration to transform the energy regime in a renewable and democratic direction, the core mandate of CEA is seen as the provision of cheap, affordable electricity to its customer base in Alginet. Cheap electricity is conceived as the major benefit that CEA provides to the community, even beyond the social

outreach activities already mentioned. Secondly, CEA perceive another major discrepancy in the models of electricity distribution cooperatives and the new wave of renewable electricity cooperatives. Although both operate according to the principles of the social economy, CEA see their model as facilitating the participation of the member base to a higher degree. The physical proximity between affiliates and staff, as well as the embeddedness of the latter in the local community of Alginet (most of them have been born and live in Alginet), render participation both more effective and deeper. By contrast, the national scope of renewable energy cooperatives and the spread of their local groups of activists is regarded as a serious obstacle to effective participation. Thirdly, CEA perceive its strategies of regime change to differ from the strategy pursued by renewable electricity cooperatives. Whereas CEA's strategy is seen as incremental and interstitial, and much in line with the approach to social change of the cooperative movement (Sempere and Garcia 2014), the overarching strategy of the renewable electricity cooperatives is portrayed as disruptive and too abrupt as well as, perhaps, counterproductive given the need to muster broad support to the energy transition from the general public.

The strategy of regime change thus builds more upon the representation of interests and less upon social mobilisation. To that end, the umbrella platform of electricity distribution cooperatives in the Valencia region remains the crucial tool. The *Federación de Cooperativas Eléctricas de la Comunitat Valenciana* was founded in 1984 after a period of intense litigation with the regional distribution monopoly, *Hidroeléctrica Española* (now *Iberdrola*). The *Federación* was especially helpful in the conflict with *Hidroeléctrica Española*, as it helped to secure the support of the regional government and ultimately broker a lasting settlement. Later on, the Federation also took an active role in advocating a specific regulation for cooperative utilities within the Spanish regulatory framework, something yet to be secured. Interestingly, the belonging to the group of traditional distribution cooperatives and the sympathy towards the niche of renewable energy cooperatives have somehow found an organisational expression in the foundation in 2017 of *Unión Renovables*, a country-wide umbrella body that assembles electricity distribution cooperatives and the largest renewable energy cooperatives established in the 2010s.

6. CONCLUSION

In this paper we set out to unpack the attitudes and strategies of the niche of community-owned electricity distribution cooperatives in Spain. We were prompted, in particular, by the

intention to unveil the existence of niches of transformative challengers beyond the ‘usual suspects.’, i.e. renewable energy cooperatives (or, more generally, the energy environmentalism movement). To do so, we have unearthed the growing alignment of one electricity distribution cooperative in Spain, CEA, with the aims of the energy transition. Our main contribution has been to characterise the orientation of CEA toward the energy transition. In particular, we have explored attitudes within CEA toward the transformations in the landscape, the opportunities opened up by ongoing changes in the regime and the attendant niche of renewable electricity cooperatives.

The orientation of Spanish electricity distribution cooperatives toward the energy transition is relevant for two reasons. First, this segment of actors has shown that it can provide the platform to nurturing major technical and managerial innovations which may, eventually, be subject to adoption or even scaling up by other actors or the electricity regime as a whole. The innovations introduced by CEA in smart metering and smart grid management, as well as the attendant embryonic practices in energy efficiency aptly illustrate this point. Second, the positive attitude of CEA toward renewable electricity cooperatives, demonstrated by the constitution of a common platform for advocacy and public awareness raising, intimates the possibility of further alliances between segments of challengers. As pro-transition policies in Spain are likely to expand and intensify in the near future, we can reasonably anticipate additional opportunities for alignment between the segment of electricity distribution cooperatives and niches of grassroots challengers. This invites a further exploration of the nature, aims, trajectories and strategies of coalitions of challengers in the Spanish energy transition between organisations moved by environmental concerns and those motivated by affordability, community welfare and other purposes. As already noted, different angles may be useful to this end: political coalitions (Hess 2014; Hess 2018), discursive coalitions (Bosman et al. 2014; Rosenbloom, Berton, and Meadowcroft 2016; Munoz et al. 2014) and advocacy coalitions (Markard, Suter, and Ingold 2016; Szarka 2010). Of singular scholarly and policy interest are ‘unconventional’ coalitions of challengers that transcend rigid ideological boundaries, e.g. the emerging rapprochement between grassroots environmentalists and traditional distribution cooperatives such as CEA.

To do so, one suggestive avenue would be following the work of Smith et al. (2016) regarding the potential connection between socio-technical transitions and social movement theories. As Smith et al. point, the idea of framing in social movement literature has proven very to understand how social movements are held together by the collective production of ideas and meaning and their contribution to creating a sense of solidarity and informing action. Drawing

on the ideas of key social movement scholars, framing involves a process of meaning production on the environment that enables a movement to organize its experience, build a narrative (Snow et al. 1986), and think about which actions are to be undertaken to address a problem and achieve change (Tarrow 1998).

In the Spanish context, the glorious decade of renewables and the subsequent policy backlash occurred in parallel to the resurgence of the niche of community-owned electricity distribution cooperatives. The latter observed with sympathy the emergence of new niches of challengers to the electricity regime and, in particular, the consolidation of renewable electricity cooperatives. As the creation of *Unión Renovables* indicates, recent years are witnessing the embryo of a coalition of pro-renewable actors. Any prediction about the future evolution of this political coalition is rendered singularly difficult by the presence of what appear to be different diagnoses of the problem (contaminating energy mix, resource depletion or unsustainable energy consumption patterns), solutions (developing all low-carbon sources, reducing consumption or de-commodifying and democratising energy) and strategies. However, the gradual re-positioning of community-owned electricity distribution cooperatives toward the pro-transition camp intimates the possibility of a growing threat to the Lampedusian energy transition that a fraction of regime incumbents seemingly aspires to carry forward.

REFERENCES

- AEVAL, Agencia Española de Evaluación y Calidad. 2011. "Evaluación Del Plan de Energías Renovables 2005-2010." <http://www.aeval.es/comun/pdf/evaluaciones/E24-PER.pdf>.
- Aklin, Michaël, and Johannes Urpelainen. 2018. *Renewables: The Politics of a Global Energy Transition*. Cambridge, MA and London: MIT Press.
- Álvarez-Díaz, Marcos, Raquel Fernández-González, and Gonzalo Caballero. 2017. "Institutional Change, Specific Investments and Photovoltaic Power Plants: The Empirical Effects of the Energy Policy of 'Solar Farms' in Spain." In *State, Institutions and Democracy: Contributions of Political Economy*, edited by Norman Schofield and Gonzalo Caballero, 327–47. Cham: Springer International Publishing. doi:10.1007/978-3-319-44582-3_14.
- Arias-Maldonado, Manuel. 2015. *Environment and Society Socionatural Relations in the Anthropocene*. Cham: Springer.
- Bauwens, Thomas, Boris Gotchev, and Lars Holstenkamp. 2016. "What Drives the Development of Community Energy in Europe? The Case of Wind Power Cooperatives." *Energy Research & Social Science* 13 (March): 136–47. doi:http://dx.doi.org/10.1016/j.erss.2015.12.016.
- Becker, Sören, Conrad Kunze, and Mihaela Vancea. 2017. "Community Energy and Social Entrepreneurship: Addressing Purpose, Organisation and Embeddedness of Renewable Energy Projects." *Journal of Cleaner Production* 147 (Supplement C): 25–36. doi:https://doi.org/10.1016/j.jclepro.2017.01.048.
- Bos, Bram, and John Grin. 2008. "'Doing' Reflexive Modernization in Pig Husbandry: The Hard Work of Changing the Course of a River." *Science, Technology, & Human Values* 33 (4). SAGE Publications Inc: 480–507. doi:10.1177/0162243907306697.
- Bosman, Rick, Derk Loorbach, Niki Frantzeskaki, and Till Pistorius. 2014. "Discursive Regime Dynamics in the Dutch Energy Transition." *Environmental Innovation and Societal Transitions* 13 (December): 45–59. doi:10.1016/j.eist.2014.07.003.
- Bridge, Gavin, Stewart Barr, Stefan Bouzarovski, Michael Bradshaw, Ed Brown, Harriet Bulkeley, and Gordon Walker. 2018. *Energy and Society: A Critical Perspective*. London: Routledge.
- Capellán-Pérez, Iñigo, Álvaro Campos-Celador, and Jon Terés-Zubiaga. 2018. "Renewable Energy Cooperatives as an Instrument towards the Energy Transition in Spain." *Energy Policy* 123: 215–29. doi:https://doi.org/10.1016/j.enpol.2018.08.064.
- Ciarreta, Aitor, Maria Paz Espinosa, and Cristina Pizarro-Irizar. 2014. "Is Green Energy Expensive? Empirical Evidence from the Spanish Electricity Market." *Energy Policy* 69 (June): 205–15. doi:http://dx.doi.org/10.1016/j.enpol.2014.02.025.
- CNMC, Comisión Nacional del Mercado de la Competencia. 2016. "Nota Informativa Sobre El Estado Actual de La Deuda Del Sistema Eléctrico." https://www.cnmc.es/Portals/0/Ficheros/Energia/AnalisisEconomico/20160127_Nota Informativa Deuda Sector Eléctrico.pdf.
- del Río, Pablo, and Pere Mir-Artigues. 2014. "A Cautionary Tale: Spain's Solar PV Investment Bubble." https://www.iisd.org/gsi/sites/default/files/rens_ct_spain.pdf.
- Eléctrica Meliana. 1998. *Meliana II: 75 Años de Cooperativismo 1923-1998*. Meliana:

- Federación de Cooperativas Eléctricas de la Comunidad Valenciana.
- Federación de Cooperativas Eléctricas de la Comunidad Valenciana. 1992. *Cooperativas Eléctricas de La Comunidad Valenciana: 70 Años Proveedores de Energía Eléctrica*. Valencia: Federación de Cooperativas Eléctricas de la Comunidad Valenciana.
- Franquesa, Jaume. 2014. "Consolidating Power, Controlling the Future: Debt and Crisis in the Spanish Electrical Sector." <https://www.focaaalblog.com/2014/07/17/consolidating-power-controlling-the-future-debt-and-crisis-in-the-spanish-electrical-sector-by-jaume-franquesa/>.
- Fuchs, Gerhard, and Nele Hinderer. 2016. "One or Many Transitions: Local Electricity Experiments in Germany." *Innovation: The European Journal of Social Science Research* 29 (3). Routledge: 320–36. doi:10.1080/13511610.2016.1188683.
- Garrués-Irurzun, Josean. 2010. "Market Power versus Regulatory Power in the Spanish Electricity System, 1973–1996." *Renewable and Sustainable Energy Reviews* 14 (2): 655–66. doi:<https://doi.org/10.1016/j.rser.2009.10.008>.
- Geels, Frank W. 2002. "Technological Transitions as Evolutionary Reconfiguration Processes: A Multi-Level Perspective and a Case-Study." *Research Policy* 31 (8–9): 1257–74. doi:[http://dx.doi.org/10.1016/S0048-7333\(02\)00062-8](http://dx.doi.org/10.1016/S0048-7333(02)00062-8).
- . 2010. "Ontologies, Socio-Technical Transitions (to Sustainability), and the Multi-Level Perspective." *Research Policy* 39 (4): 495–510. doi:<http://dx.doi.org/10.1016/j.respol.2010.01.022>.
- . 2011. "The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms." *Environmental Innovation and Societal Transitions* 1 (1): 24–40. doi:<http://dx.doi.org/10.1016/j.eist.2011.02.002>.
- . 2014. "Regime Resistance against Low-Carbon Transitions: Introducing Politics and Power into the Multi-Level Perspective." *Theory, Culture & Society* 31 (5): 21–40. doi:10.1177/0263276414531627.
- Geels, Frank W., Florian Kern, Gerhard Fuchs, Nele Hinderer, Gregor Kungl, Josephine Mylan, Mario Neukirch, and Sandra Wassermann. 2016. "The Enactment of Socio-Technical Transition Pathways: A Reformulated Typology and a Comparative Multi-Level Analysis of the German and UK Low-Carbon Electricity Transitions (1990–2014)." *Research Policy* 45 (4): 896–913. doi:<http://dx.doi.org/10.1016/j.respol.2016.01.015>.
- Geels, Frank W., and Johan Schot. 2010. "The Dynamics of Transitions: A Socio-Technical Perspective." In *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*, edited by John Grin, Jan Rotmans, Johan Schot, Frank W. Geels, and Derk Loorbach, 9–87. New York, NY: Routledge.
- Geels, Frank W., Benjamin K. Sovacool, Tim Schwanen, and Steve Sorrell. 2017. "The Socio-Technical Dynamics of Low-Carbon Transitions." *Joule* 1 (3): 463–79. doi:<https://doi.org/10.1016/j.joule.2017.09.018>.
- Geels, Frank W., and Johan Schot. 2007. "Typology of Sociotechnical Transition Pathways." *Research Policy* 36 (3): 399–417. doi:<http://dx.doi.org/10.1016/j.respol.2007.01.003>.
- Giménez Guarinos, José Miguel, Elisa Giménez Fita, Raquel Giménez Fita, and José Joaquín Cervera Garzón. 2011. *Un Paseo Por Vinalesa*. Edited by Eléctrica de Vinalesa. Vinalesa.
- Gómez, Antonio, César Dopazo, and Norberto Fueyo. 2016. "The 'Cost of Not Doing' Energy

- Planning: The Spanish Energy Bubble." *Energy* 101 (April): 434–46.
doi:<http://dx.doi.org/10.1016/j.energy.2016.02.004>.
- Haas, Tobias. 2018. "The Political Economy of an Interrupted Energy Transition: Power Relations, Civil Society, and Hegemony in Spain." *Conference Paper, International Sustainability Transitions, Manchester, June 11-14*.
<http://documents.manchester.ac.uk/display.aspx?DocID=37292>.
- . 2019. "Struggles in European Union Energy Politics: A Gramscian Perspective on Power in Energy Transitions." *Energy Research & Social Science* 48: 66–74.
doi:<https://doi.org/10.1016/j.erss.2018.09.011>.
- Heffron, Raphael J., and Darren McCauley. 2017. "The Concept of Energy Justice across the Disciplines." *Energy Policy* 105 (Supplement C): 658–67.
doi:<https://doi.org/10.1016/j.enpol.2017.03.018>.
- Heras-Saizarbitoria, Iñaki, Lucía Sáez, Erlantz Allur, and Jon Morandeira. 2018. "The Emergence of Renewable Energy Cooperatives in Spain: A Review." *Renewable and Sustainable Energy Reviews* 94: 1036–43. doi:<https://doi.org/10.1016/j.rser.2018.06.049>.
- Hess, David J. 2014. "Sustainability Transitions: A Political Coalition Perspective." *Research Policy* 43 (2): 278–83. doi:<http://dx.doi.org/10.1016/j.respol.2013.10.008>.
- . 2018. "Energy Democracy and Social Movements: A Multi-Coalition Perspective on the Politics of Sustainability Transitions." *Energy Research & Social Science* 40: 177–89.
doi:<https://doi.org/10.1016/j.erss.2018.01.003>.
- Huber, Matthew T. 2015. "Energy and Social Power: From Political Ecology to the Ecology of Politics." In *The Routledge Handbook of Political Ecology*, edited by Tom Perreault, James McCarthy, and Gavin Bridge, 481–92. London: Routledge.
- Islar, Mine, and Henner Busch. 2016. "'We Are Not in This to Save the Polar Bears!' – the Link between Community Renewable Energy Development and Ecological Citizenship." *Innovation: The European Journal of Social Science Research* 29 (3). Routledge: 303–19.
doi:10.1080/13511610.2016.1188684.
- Köhrsen, Jens. 2018. "Exogenous Shocks, Social Skill, and Power: Urban Energy Transitions as Social Fields." *Energy Policy* 117: 307–15.
doi:<https://doi.org/10.1016/j.enpol.2018.03.035>.
- Kungl, Gregor. 2015. "Stewards or Sticklers for Change? Incumbent Energy Providers and the Politics of the German Energy Transition." *Energy Research & Social Science* 8 (July): 13–23. doi:<http://dx.doi.org/10.1016/j.erss.2015.04.009>.
- Markard, Jochen, Marco Suter, and Karin Ingold. 2016. "Socio-Technical Transitions and Policy Change – Advocacy Coalitions in Swiss Energy Policy." *Environmental Innovation and Societal Transitions* 18 (March): 215–37.
doi:<http://dx.doi.org/10.1016/j.eist.2015.05.003>.
- Mercado-Sáez, María-Teresa, Elisa Marco-Crespo, and Àngels Álvarez-Villa. 2018. "Exploring News Frames, Sources and Editorial Lines on Newspaper Coverage of Nuclear Energy in Spain." *Environmental Communication*, February. Routledge, 1–14.
doi:10.1080/17524032.2018.1435558.
- Munoz, L. A. Hurtado, J.C.C.M. Huijben, B. Verhees, and G. P. J. Verbong. 2014. "The Power of Grid Parity: A Discursive Approach." *Technological Forecasting and Social Change* 87 (September): 179–90. doi:<http://dx.doi.org/10.1016/j.techfore.2013.12.012>.

- OECD, Organisation for Economic Co-operation and Development, and International Energy Agency IEA. 2015. *Energy Policies of IEA Countries: Spain 2015 Review*. Paris: IEA Publications.
- Pellicer-Sifres, Victoria, Sergio Belda-Miquel, Ivan Cuesta-Fernandez, and Alejandra Boni. 2018. "Learning, Transformative Action, and Grassroots Innovation: Insights from the Spanish Energy Cooperative Som Energia." *Energy Research & Social Science* 42: 100–111.
- Ratinen, Mari, and Peter D. Lund. 2014. "Growth Strategies of Incumbent Utilities as Contextually Embedded: Examples from Denmark, Germany, Finland and Spain." *Technology in Society*, no. 38: 81–92.
- Riutort, Sebastià. 2016. *Energía Para La Democracia*. Madrid: Fuhem Ecosocial y La Catarata.
- Romero-Rubio, Carmen, and José Ramón de Andrés Díaz. 2015. "Sustainable Energy Communities: A Study Contrasting Spain and Germany." *Energy Policy* 85: 397–409. doi:<https://doi.org/10.1016/j.enpol.2015.06.012>.
- Rosenbloom, Daniel, Harris Berton, and James Meadowcroft. 2016. "Framing the Sun: A Discursive Approach to Understanding Multi-Dimensional Interactions within Socio-Technical Transitions through the Case of Solar Electricity in Ontario, Canada." *Research Policy* 45 (6): 1275–90. doi:<http://dx.doi.org/10.1016/j.respol.2016.03.012>.
- Rotmans, Jan, René Kemp, and Marjolein van Asselt. 2001. "More Evolution than Revolution: Transition Management in Public Policy." *Foresight* 3 (1): 15–31. doi:10.1108/14636680110803003.
- Sánchez-Ortiz, Jaime, Teresa García-Valderrama, Vanessa Rodríguez-Cornejo, and Yolanda Giner-Manso. 2018. "The Effects of Environmental Regulation on the Efficiency of Distribution Electricity Companies in Spain." *Energy & Environment*, January. SAGE Publications Ltd STM, 0958305X17745791. doi:10.1177/0958305X17745791.
- Scoones, Ian, Melissa Leach, and Peter Newell, eds. 2015. *The Politics of Green Transformations*. Abingdon and New York, NY: Earthscan.
- Sempere, Joaquim, and Ernest Garcia. 2014. "¿Qué Papel Pueden Tener Las Cooperativas En Una Transición Postcarbono? Reflexiones Desde El Cooperativismo En Cataluña." *Revista de Economía Crítica*, no. 18: 31–47.
- Seyfang, Gill, Sabine Hielscher, Tom Hargreaves, Mari Martiskainen, and Adrian Smith. 2014. "A Grassroots Sustainable Energy Niche? Reflections on Community Energy in the UK." *Environmental Innovation and Societal Transitions* 13: 21–44. doi:<http://dx.doi.org/10.1016/j.eist.2014.04.004>.
- Seyfang, Gill, Jung Jin Park, and Adrian Smith. 2013. "A Thousand Flowers Blooming? An Examination of Community Energy in the UK." *Energy Policy* 61 (October): 977–89. doi:<http://dx.doi.org/10.1016/j.enpol.2013.06.030>.
- Smith, Adrian. 2007. "Translating Sustainabilities between Green Niches and Socio-Technical Regimes." *Technology Analysis & Strategic Management* 19 (4). Routledge: 427–50. doi:10.1080/09537320701403334.
- Smith, Adrian, Juan Mariano Fressoli, Dinesh Abrol, Elisa Arond, and Adrian Ely, eds. 2016. *Grassroots Innovation Movements*. London: Routledge.
- Smith, Adrian, Jan-Peter Voß, and John Grin. 2010. "Innovation Studies and Sustainability Transitions: The Allure of the Multi-Level Perspective and Its Challenges." *Research Policy*

- 39 (4): 435–48. doi:<https://doi.org/10.1016/j.respol.2010.01.023>.
- Snow, David A., E. Burke Rochford Jr., Steven K. Worden, and Robert D. Benford. 1986. "Frame Alignment Processes, Micromobilization, and Movement Participation." *American Sociological Review* 51 (4).
- Stenzel, Till, and Alexander Frenzel. 2008. "Regulating Technological Change—The Strategic Reactions of Utility Companies towards Subsidy Policies in the German, Spanish and UK Electricity Markets." *Energy Policy* 36 (7): 2645–57. doi:<http://dx.doi.org/10.1016/j.enpol.2008.03.007>.
- Swyngedouw, Erik. 2011. "¡La Naturaleza No Existe! La Sostenibilidad Como Síntoma de Una Planificación Despolitizada / Nature Does Not Exist! Sustainability as Symptom of a Depoliticized Planning." *Urban*, no. NS01: 41–66.
- Szarka, Joseph. 2010. "Bringing Interests Back in: Using Coalition Theories to Explain European Wind Power Policies." *Journal of European Public Policy* 17 (6): 836–53. doi:[10.1080/13501763.2010.486988](https://doi.org/10.1080/13501763.2010.486988).
- Tarrow, Sidney. 1998. *Power in Movement: Social Movements and Contentious Politics*. Cambridge: Cambridge University Press.
- Unruh, Gregory C. 2000. "Understanding Carbon Lock-In." *Energy Policy* 28 (12): 817–30. doi:[http://dx.doi.org/10.1016/S0301-4215\(00\)00070-7](http://dx.doi.org/10.1016/S0301-4215(00)00070-7).
- van der Vleuten, Erik, and Per Högselius. 2012. "Resisting Change? The Transnational Dynamics of European Energy Regimes." In *Governing the Energy Transition: Reality, Illusion, or Necessity?*, edited by Geert Verbong and Derk Loorbach, 75–100. London: Routledge.
- Vancea, Mihaela, Sören Becker, and Conrad Kunze. 2017. "Local Embeddedness in Community Energy Projects. A Social Entrepreneurship Perspective." *Revista Internacional de Sociología* 75 (4): e077. doi:[10.3989/ris.2017.75.4.17.03](https://doi.org/10.3989/ris.2017.75.4.17.03).
- Verbong, Geert, and Frank W. Geels. 2010. "Exploring Sustainability Transitions in the Electricity Sector with Socio-Technical Pathways." *Technological Forecasting and Social Change* 77 (8): 1214–21. doi:<http://dx.doi.org/10.1016/j.techfore.2010.04.008>.
- Walker, Gordon, Patrick Devine-Wright, Sue Hunter, Helen High, and Bob Evans. 2010. "Trust and Community: Exploring the Meanings, Contexts and Dynamics of Community Renewable Energy." *Energy Policy* 38 (6): 2655–63. doi:<https://doi.org/10.1016/j.enpol.2009.05.055>.
- Yin, Robert K. 1994. *Case Study Research: Design and Methods*. 2nd ed. Thousand Oaks, CA: SAGE.

ⁱ Source: <http://informeestadistico.idae.es/t10.htm> (accessed 16 July 2018).

ⁱⁱ See www.nobelgrid.eu and www.hyrim.net.