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RESEARCH ARTICLE

Transmitting the Transition in a Moment of Climate Crisis: An Analysis of Intermediaries' Communication Practices

Recto running head : ENVIRONMENTAL COMMUNICATION


Verso running head : D. WUEBBEN ET AL.

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ABSTRACT

Distinct rhetoric and approaches are used to communicate the facts and possibilities of the climate crisis and energy transitions. To better understand climate and energy-related communication practices and objectives at the national level, this research applies grounded theory analysis to transcripts of semi-structured interviews with intermediaries in Spain. The intermediaries interviewed include researchers, engineers, professionals with energy-related roles in government, and coordinators of electricity cooperatives. Our analysis produced two overarching results: (1) communication is seen as a means to raise awareness, change behavior, and engage the public, and each of these means is seen as a method to empower citizens; (2) the language of systemic change is used broadly to refer to changing political, economic, or technological systems; however, some systemic changes seem incomplete or incompatible with other systems. Further research is required to test these hypotheses and show how distinct communication approaches might be reconciled in energy transition policy and initiatives.

KEYWORDS

- Energy transition
- public engagement
- intermediaries
- systems thinking
- grounded theory
- energy policy^[Q1]

1. Introduction

Anthropogenic climate change has and will continue to exacerbate global environmental and humanitarian crises (IPCC, 2023); meanwhile, the transition to decentralized, renewable energy networks is underway (IEA, 2022). In the European Union, member states have adopted a European Green Deal and endorsed targets to reduce greenhouse gas emissions by at least 55% by 2030 and to reach net-zero emissions by 2050 (Amanatidis, 2019). Spain has set its national target to cut emissions by 23% by 2030 compared to 1990 levels, with plans to eliminate coal power by 2030 and to ban sales of new gasoline and diesel vehicles by 2040 (MITECO, 2020a). Despite ambitious national and international targets, the necessary speed, intensity, pathways, and climate impacts of energy transitions remain uncertain and hotly contested.

Communication research can provide insights into the meanings, values, and strategies of long-term transition goals and near-term actions, including how different stakeholders shape, and are shaped by distinct discourses. Of special interest in this article is how energy transition intermediaries in Spain communicate (a) The relationships between energy transitions and anthropogenic climate change, (b) How sweeping decarbonize efforts are revamping vast, complex, and technologically advanced energy systems, and (c) How technical changes to energy systems may spark desired social change (e.g. improved jobs, health, sustainability, etc.).

The role of intermediaries in energy transitions has been well established (Bird & Barnes, 2014; Hargreaves et al., 2013; Rohracher, 2010; Shaw et al., 2018; Warbroek et al., 2018). Intermediaries are individuals or groups who translate or negotiate between actors. They can exert a certain agenda-setting power and disseminate public-facing narratives on issues like renewables, decentralization, and energy security. Intermediaries emerge from a range of roles including media outlets, researchers, policymakers, NGOs, businesses, and community organizations and thereby occupy a unique capacity to develop trust and confidence in transition tools and processes (Busch & Hansen, 2021; Kivimaa et al., 2019; Podkalicka, 2019; Sovacool et al., 2020; Van Boxstael et al., 2020). By definition, some intermediaries are also “middle actors,” or individuals that more actively participate in energy systems and are capable of creating – and sometimes preventing – change (Parag & Janda, 2014; Zohar et al., 2021). Here, we argue that some intermediaries, like middle actors, have agency even if they do not directly draft policy, wield legislative power, or earn a living by directly selling any goods or services. Intermediaries link and coordinate the various strands of expertise, learning, and feedback; however, there is a lack of understanding of how these strands solidify and form more solid bridges between, for example, distant government carbon reduction targets and the rhythms of domestic life.

For intermediaries, communicating about climate change, decarbonization, and their justice implications involves navigating

diverse technical, political, economic, and social terrains. How do intermediaries gain and express authority or craft tailored communication campaigns when speaking about vast, complex, powerful environmental and technological systems impacted by many actors simultaneously? What concepts are shaping energy transition discourse and potentially bridging scientific research, energy policy, climate justice, and individual actions in this moment of the climate crisis? How do intermediaries adjust existing frames or create new ones? Answering these three questions reveals how communication compliments and shapes intermediaries' collective approach to complex socio-technical networks. It also reveals opportunities and challenges for fostering public discourse and engagement at the nexus of climate, energy, and justice.

The following study examines Spanish intermediaries' energy communication practices. Spain is a fitting setting for such research. On one hand, the potential economic and social benefits of Spain's energy transition are clear. The Iberian peninsula possesses distinct geographical and economic advantages: expansive land mass, high solar irradiance (Sánchez-Durán et al., 2019), and an already established wind industry that, coupled with ports and shipyards, is poised to spread offshore (Ramírez et al., 2018). In 2020, amid lockdowns, curfews, and travel restrictions, an estimated 2,633 MW of solar PV was installed in Spain (Sanchez Molina, 2021). Many media outlets and energy analysts have viewed this as an encouraging trend, with one explaining that solar energy "should be one of the main focuses of economic recovery" after the COVID-19 pandemic (Santiago et al., 2021). The implementation of the Recovery Plan in Spain could generate approximately 356,000 new green jobs by the year 2023 (García Vaquero et al., 2021). On the other hand, Spain is especially vulnerable to the impacts of climate change. Droughts, floods, wildfires, eroding coastlines, and desertification have pressed the urgency of climate action and climate change is a top concern among Spaniards of all ages (Enríquez & Martínez, 2023).

As Spain and other countries work to transition vast energy systems at the pace required by climate science, communication will be central to coordinating expertise, boosting public engagement, and linking top-down policy to everyday life. Examining intermediaries' messaging in Spain provides insights applicable to other contexts undergoing large-scale decarbonization.

The next section offers further context for the relationships between environmental and energy communication and reviews research on energy communication approaches in the Spanish context. This is followed by an explanation of our methods and our application of grounded theory to semi-structured interviews with Spanish energy intermediaries, including researchers, engineers, professionals with roles in government, and coordinators of electric cooperatives. Our results section presents and examines the dominant codes, code groups, and networks that emerged from our recursive, deductive inspections of transcripts. Finally, we call for further research to better understand how intermediaries' communication efforts empower citizens and how the language of systems rhetoric could more clearly articulate anticipated modifications to technological and ecological systems.

2. Background

2.1. Energy communication

Energy communication research has been defined as "the study of symbolic practices surrounding materials experiences with energy resources, production, and consumption" (Endres et al., 2016, p. 420). The results of such research may reveal how diverse groups and stakeholders understand energy and their social, political, and psychological implications. As modern energy systems shape societal, environmental, and technological landscapes, energy communication researchers can "help describe, facilitate, explain, critique, and evaluate" those landscapes and establish citizens' roles within them (Fahy, 2020). Three further lines of energy communication inquiry have been outlined by (Cozen et al., 2018): the communicative aspects of energy activism (e.g. Beyond Oil, Extinction Rebellion, etc.), energy colonialism, and environmental justice (Keystone and Dakota Access pipelines, etc.), and energy democracy (community solar, positive energy districts, etc.). Subsequent studies have also noted energy's diverse societal roles and how those roles shape advertisements, research agendas, and policy campaigns in different international contexts (Menagarishvili et al., 2019).

Of note for this special issue, both (Endres et al., 2016) and (Cozen et al., 2018) hope to distinguish energy communication from environmental communication in part by showing energy communication research had been *limited* by a "crisis frame." They argue that the field of energy communication consists predominantly of studies related to high-profile energy crises such as gas shortages, nuclear disasters, and oil spills. Therefore, they call for energy communication to be broadened to address everyday practices and understandings of energy across contexts, national boundaries, and technologies. Certainly, energy communication research can contribute to a more sustainable future by shifting human modes of thinking and habits, rather than simply responding to particular crises. To this end, recent research has examined the energy communication of home solar installations (Neves & Oliveira, 2021; Wuebben & Peters, 2022) and energy-efficiency heating appliances. On the one hand, energy communication research must extend beyond the crisis frame. On the other, the abundant production and overconsumption of energy have produced the majority of the carbon emissions blanketing our atmosphere and causing climate change, a dire environmental threat. Intermediaries in the energy transition are challenged with navigating between the

frames of crisis (“clock is ticking,” “approaching catastrophic tipping points,” etc.) and more positive and hopeful frames related to behavior change, equity, democracy, and justice (i.e. “leave no one behind”). Although energy communication may offer a distinct line of inquiry, the modern meanings and uses of energy cannot be fully severed from environmental concerns which, currently, seem to be pervaded by crisis.

2.2. Top-down, bottom-up, and middle-out in the Spanish context

The balance between examining closed, stable energy systems and more open, environmental impacts is germane to the middle-out approach, which is one of the three common approaches or practices of energy communication. We identify these approaches as:

- 1 Rhetorical strategies exhibited from a top-down approach.
- 2 Public engagement, which applies a bottom-up approach in which citizens gain access to, and ideally understand energy production and consumption.
- 3 Professional discourse in which individuals convey and cultivate experience and expertise from a middle-out approach.

In what follows, we show how these approaches and practices in the context of Spanish energy communication.

Like the centralized energy systems they signify, the energy communication regularly practiced by utilities, energy corporations, government entities, and major media outlets often adopt an authoritarian tone and a top-down approach. In Spain, television advertisements by Spanish energy giants Iberdrola, Endesa, and Naturgy have “greened” their marketing materials to include colors, text, and narratives associated with sustainability and environmental protection; however, 73.9% of their advertisements display a primary focus on price and special offers, and for 44.2% of consumers, energy prices remain the most relevant factor in their decisions about contracting (Bañares et al., 2021). Top-down energy communication tends to adopt the logos of costs and benefits and the ethos of institutional strength and stewardship. Indeed, across the world, energy company and utility slogans and symbols are often designed to evoke associations with increased wealth, comfort, autonomy, and security (Ernst et al., 2017). In Spain, major energy companies like Iberdrola or Endesa play an outsized role in shaping energy narratives alongside influential media outlets and policymakers. Indeed major media outlets may repeat this top-down approach by uncritically relaying or commenting on official statements, energy prices, and other industry developments.

In contrast, the bottom-up approach privileges local knowledge and involves citizens directly in energy decisions. The bottom-up approach often takes the form of participatory workshops, town hall meetings, and other forms of community engagement. Bottom-up energy communication can also question the citizen-as-consumer and knowledge-deficit models of engagement. Many scholars have adopted bottom-up approaches to argue for more open, inclusive, and reflexive forms of energy communication (Bauwens, 2016; Qi et al., 2020). Promising strands of tailored bottom-up energy communication research relate to citizens’ willingness to pay for cleaner energy systems (Cohen et al., 2018) and how a better understanding of social relationships can change demand-side behaviors (Hargreaves & Middlemiss, 2020).

Our research focuses on intermediaries who may shift between top-down and bottom-up approaches and thereby adopt a “middle-out” approach. The middle-out approach has been most often associated with “middle actors” (Janda & Parag, 2013; Parag & Janda, 2014; Zohar et al., 2021, 2022). We maintain that intermediaries have comparable agency and capacity as middle actors, especially intermediaries who adopt sustained and purposeful communication with the public and policymakers. For example, some journalists and media outlets may adopt a middle-out approach to raise awareness about policy concerns or to challenge top-down messages. (Heras-Saizarbitoria et al., 2011) notes how, in the aftermath of the 2008 crisis, Spanish journalists swayed readers using metaphors like *burbuja solar* [solar bubble] to influence readers’ views of energy companies and their massive solar farms. Recently, the Spanish media has also elevated the concept of “energy poverty,” and the rising prevalence of the term has corresponded with policymakers developing more coordinated responses to this pressing social issue (Sanz-Hernández, 2019). Shedding light on overlooked and dark issues such as energy poverty often requires bottom-up, grassroots approaches (Barrella et al., 2022).

For academic intermediaries in Spain, the middle-out approach can, on one side, acknowledge how policy encourages the deployment of renewables while simultaneously challenging the government and regulators to improve transparency and strengthen citizens’ rights for “understanding and participating in energy related issues” (Sorman et al., 2020). The transition must also be more closely aligned with the values of “equity, sustainability, participation, and diversity” (Pellicer-Sifres et al., 2018). More specifically, renewable energy cooperatives, which currently occupy a small sliver of the total production and consumption in Spain, must “project a public image that transmits the social, economic, and environmental benefits of renewable energy” (Capellán-Pérez et al., 2018). These studies suggest that, by adopting a middle-out approach, intermediaries can initiate, motivate, support, and upscale change or introduce innovative and overlooked ways to overcome path

dependencies.

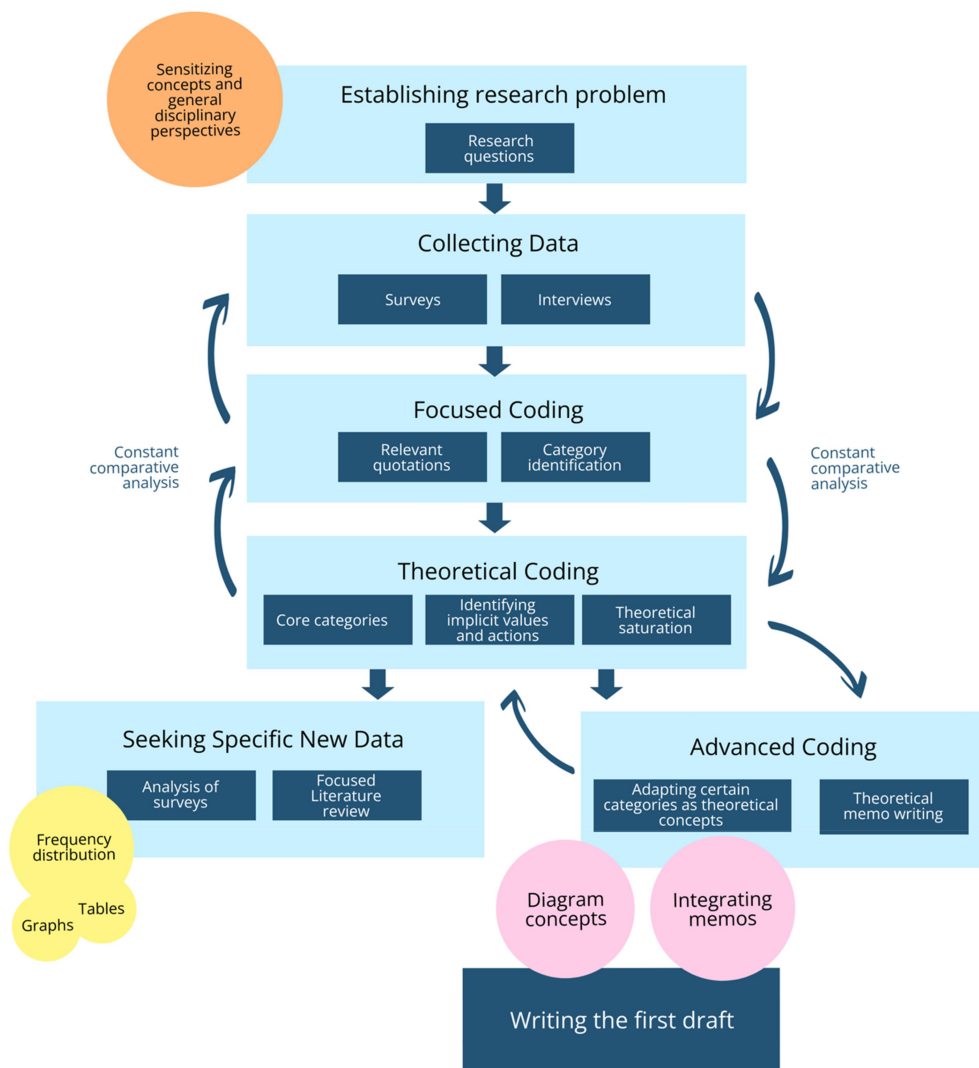
Other research on public engagement and participatory workshops in Spain have aspired to tip the balance of power away from existing incumbents and towards smaller-scale, more flexible social structures and institutions (Hewitt et al., 2017). Subsequent studies have deployed participatory multi-criteria analysis and system models to engage Spanish villagers in the development of renewable energy communities (Lode et al., 2023). Structured projects and engagement workshops conducted by researchers and practitioners can bring communities together and help them collaborate, share resources, and envision desirable energy futures. Of course, many intermediaries also engage policymakers and everyday citizens within a saturated mediascape. In other words, intermediaries do not always operate in environments as controlled as workshops, conferences, hearings, or publications. Instead, they must often push from the middle-out and hope to garner attention in a complex media landscape where spikes in oil prices or the bottom line on monthly energy bills can blur the razor-thin lines between evolving environmental catastrophes, the cold bureaucracy of energy system management, and the various technologies and environmental impacts that spread out from the wires inside our homes.

3. Methodology

Our analysis of intermediaries energy communication practices was performed using the methods of grounded theory, which has been recently applied by energy researchers to offer qualitative insights into the latent social patterns of energy policy narratives (Debnath et al., 2020), to show how attachments to place and constructs of entrepreneurship impact community-based renewable energy (Süsser et al., 2017), and to underscore the sociotechnical imaginaries in the EU's promotion of electric vehicles (Di Felice et al., 2021).

Grounded theory is a process of open coding and constant comparison intended to generate credible, resonant, and useful concepts that explain patterns of thinking and behavior (Corbin & Strauss, 1990). The structured process of grounded theory involves several steps, including the constant comparative method, in vivo coding, axial coding, and selective coding of data (Figure 1). According to Clarke and Friese (2007), this method allows for a deeper understanding of the phenomenon within its context and boundaries. At the same time, this process helps to understand the perspective of a specific group within a population without preconceived notions or the need to establish formal theories (Gómez, 2011). The grounded theory approach is based on the belief that complex social systems are comprised of various parts, which can have non-linear impacts and have a high degree of uncertainty due to their fluid nature (Bauman, 2000). Overall, this method provides a way to examine and analyze the various elements that influence social phenomena. Therefore, the process of grounded theory is not intended to result in a new theory per se, but to clarify patterns and generate hypotheses that might be tested with further empirical research.

Figure 1. Process and application of grounded theory, as adopted from (Charmaz, 2006).



For our data collection, initial participants were identified by a search through the Cordis database of EU-funded Horizon 2020 (H2020) projects that were directed by academic or industry groups in and around Madrid, Spain. H2020 is an international research program, which requires detailed communication and dissemination plans. Requests for interviews were sent via email and a round of initial interviews was conducted. After the first round of interviews, additional participants were identified based on a snowballing effect, as some initial interviewees suggested other key stakeholders in the same field who might have insights on communication and public engagement. This led to a further round of email requests and helped us interview intermediaries with different disciplinary backgrounds and associations (academia, community energy organizers, project managers, government employees) but who displayed similar goals (i.e. decarbonization, citizen empowerment, grid efficiency). Overall, 11 in-person interviews were conducted.

The interviews were semi-structured, which means we asked all interviewees a baseline of questions related to communication, behavior change, Spain's role in the energy transition, and recent or pending policy developments. These questions are provided in Research Data Appendix B. Interviewees were invited to respond in English, Spanish, or both languages, depending on their comfort level. 8 of the 11 interviewees responded in English. Supplemental questions and impromptu dialogue allowed the interviewees to expand upon their understanding and experiences. After we gathered the transcripts from the semi-structured interviews, we felt we needed a clearer, more structured, quantitative comparison of the intermediaries and their thoughts on the targets, time, and effectiveness of their communication efforts. Therefore, each of them was asked to complete a follow-up survey comprised of Likert-scale questions and short responses. These surveys were completed by 10 of 11 interviewees. An additional intermediary completed the survey but could not be interviewed; therefore, we have a total of 11 interviews and 11 survey responses.

The in-person interviews were conducted and video recorded by the first author. The video recordings were edited and published on our research group's YouTube channel (Grupo Ciberimaginario, 2020). These short videos provide examples of energy communication. For our data analysis, the audio recordings helped us translate and transcribe the interviews. The responses offered in Spanish were translated into English, and the 11 text files were uploaded into Atlas.ti software, which was used to carry out the grounded theory process.

During our first round of open coding, all three authors separately examined the transcripts and identified what they

considered the initial codes (e.g. "politics," "public engagement") that emerged from the discourses. They then met to review their codes, identify overlaps, and generate intercoder reliability. For instance, after our initial reviews, we had separately produced codes including "promoting energy communities," "potential of energy communities," and "collaborating with energy communities." After a review of the data, these codes were merged into the code "energy communities."

During the second round of analysis, we used in-vivo axial coding and turned our focus to statements about communication actions and targets including statements that reflected valuing, educating, reviewing policy choices, or projecting policy outcomes. Some of the codes from this round of review were easily merged; other codes required further revisions. For example, the code "identifying communication gaps" was created by merging the codes "identifying communication challenges" and "identifying community challenges." This form of axial coding and organized inductive reasoning has been previously used to link communication practices to important policy decisions (Landeta-Manzano et al., 2018; Süsser et al., 2017). Codes and code groups resulting from the analysis are included in Research Data as Appendix A.

After focusing on axial coding, we meet biweekly to begin the constant comparison of quotes, codes, and code groups to generate links and relationships while refining definitions and eliminating ambiguous codes. During each meeting, we would reread the quotes and codes to associate the second, third, or fourth codes with specific quotes. These meetings also helped us identify categories and then verify our interpretations by defining code groups for theoretical coding (Figure 1).

The defining of core categories and identification of their implicit values and actions helped us determine that we had reached theoretical saturation. The concept of theoretical or content saturation is an analytical technique that helps to ensure a thorough and nuanced understanding of the relationships between categories in a theory. It involves continuing to collect data until all the relevant categories are fully developed and no new codes emerge. This helps to create a well-balanced and precise theory and allows the researcher to identify when it is appropriate to stop collecting data (Corbin & Strauss, 1990). In other words, we first worked to eliminate redundant codes and then to group quotes and identify specific criteria for code groups such as "value of communication" or "empowering citizens."

After several rounds of discussion and analysis, we decided to classify the interview data according to discipline or profession. The importance of the participant's disciplinary training or professional status was not apparent until we began to develop hypotheses related to the comments about codes related to "centering citizens" and adopting a "systems perspective." Therefore, the quotes that appear in this text are followed by shorthand references for the dominant role and number: Engineer (EN-1, EN-2, EN-3), academic (AC-1, AC-2, AC-3), community organizer (COM-1, COM-2, COM-3), and non-elected government employee (GOV-1, GOV-2). The value of these distinctions is discussed further in the results.

With our theoretical statements from the transcripts complete, we compiled our links, memos, and theoretical statements. We then conducted a focused literature review (returning us to the stage of data collection) and composed the following results.

4. Results and discussion

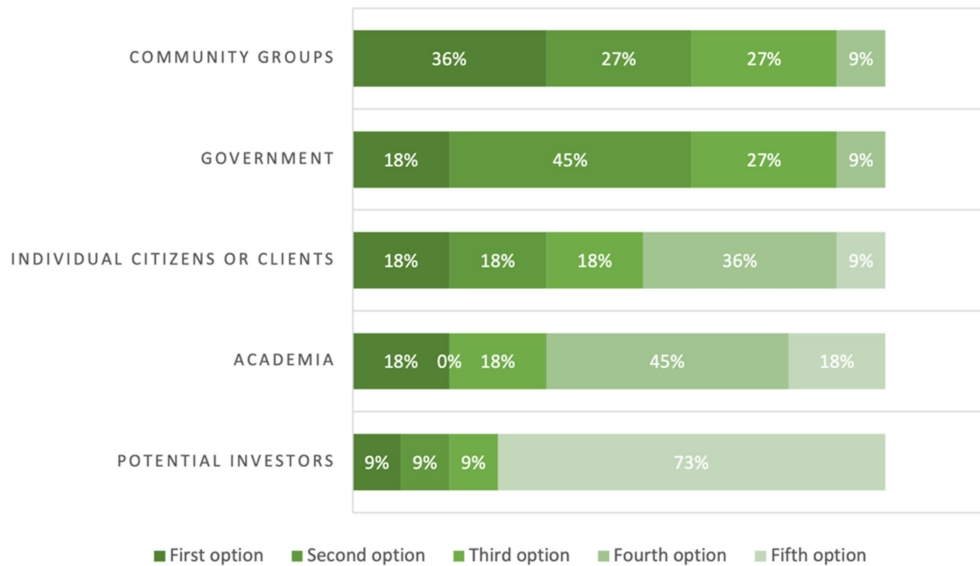
The following sections present the findings of the grounded analysis of the interview transcripts.

4.1. The value and practice of public communication

Our data showed the strong value of communication and awareness of intended communication outcomes (Figure 2). Respondents described the value of public-facing communication efforts such as online webinars, public consultation periods, app development, and an increased presence across social media platforms. They also identified the need to improve their communication practices, one noting that "engineers and scientists in general" need to "get more involved in communication" [EN-3], and another that energy experts must "take care of the level of communication" [AC-1] when speaking with non-experts. From these quotes, we infer that intermediaries view energy communication as a means of reaching a broader public audience.

Figure 2. Responses to a ranked-choice question related to the primary targets of communication efforts.

COMMUNICATION TARGETS



During our grounded analysis, statements coded for “valuing public communication” displayed three interlinked outcomes of communication actions: raising awareness, public engagement, and changing behaviors. One interviewee explained that “energy systems are so complex, obtuse, and often associated with huge companies that want to take advantage of customers” [COMM-2]. This suggests that an important aspect of energy communication as raising awareness is protecting citizens who might be vulnerable to misleading information.

Analyses of the interviews revealed these intermediaries’ distinct messages and desired outcomes. Some spoke of the need for web pages that dissect and analyze each item on a customer’s monthly bill. Others suggested the Spanish public must become more “conscious that from the final electricity tariff, only twenty-five to thirty percent is the cost of producing electricity” [EN-3]. Another interviewee argued that energy communication needs to increase energy literacy: “It’s important for people to become more aware of what is behind the wall” [AC-2]. The support for broader energy literacy spanned from how to rewire the grid to the political and regulatory influences on the power system. Returning to our initial question regarding how intermediaries gain and express authority, the response suggests that at least one method for gaining authority is through pedagogical activities. By composing educational materials and organizing workshops and other hands on activities, the middle actors help citizens and consumers gain access to and understand information about the energy system and they become more confident in their practice of energy communication. Multiple interviewees noted that the 2008 financial crisis and a blend of public outrage and confusion regarding Spain’s “sun tax” policy provided important motivations for the shift to energy cooperatives. This claim has been confirmed by a review of previous research (Ríos Alba et al., 2017). For intermediaries, spreading awareness of the history of local and national energy policies further motivates citizens to act in the present.

Interviewees highlighted a direct correlation between their communication efforts and public engagement, emphasizing citizen participation as both a key goal and a significant challenge in the energy transition. Responses to inquiries about communication objectives underscored this focus: “The most important thing would be to encourage more citizen participation” [COMM-1], and “having that dual channel of communication, aiming not only to encourage citizens but also to gather their day-to-day observations” [GOV-3]. This leads us back to our initial question about how intermediaries establish and demonstrate authority. The findings suggest that engaging in educational activities is a pivotal method for gaining this authority. By developing educational content, conducting workshops, and facilitating other interactive experiences, intermediaries enable citizens to access and comprehend information about the energy system and bolster their own energy communication practices.

The respondents also noted that public participation and the bottom-up approach faced significant challenges. A generally low social engagement with energy issues was identified as a strong motivator for communication actions, including claims such as “people are interested, but it’s not a priority” [GOV-2] and “energy is not a subject that attracts citizens” [COMM-2]. Our data collection coincided with a national state of alarm in Spain, and the inability to hold public meetings or to gather in groups had negatively impacted public engagement efforts. Participants discussed the transition to online platforms, including the development of webinars and a YouTube channel, but their perception of the impact of digital engagement methods was mixed, similar to the results of an EU-wide survey of energy and public engagement activities (Süsser et al., 2021).

The importance of measured and robust public communication was supported by the survey responses, in which 64% of respondents noted they were currently spending “more time and effort” on public communication activities and 36% reported

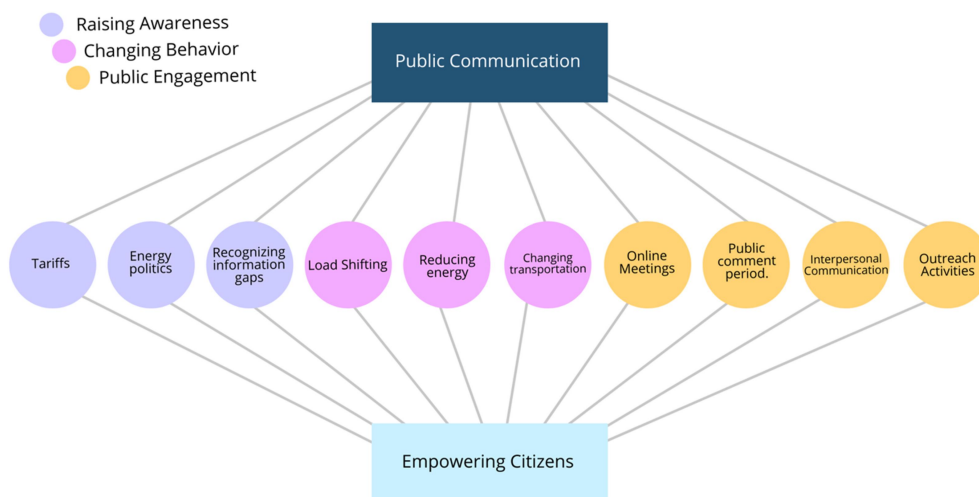
spending at least the same amount of time and effort. These responses were also relatively even for individuals who primarily identified as working in engineering, academia, government, or community energy. Furthermore, the survey results show that the primary target of communication activities was “community groups” with a secondary target of “government” entities, including policymakers (Figure 2). Although actions like publishing in academic peer-reviewed journals and using research results to motivate policymakers were selected by some respondents, the public was their primary communication target.

The time-specific challenges of reaching the intended audiences appeared in explanations about typical channels – “our primary communication channel is personal, one-to-one” [COMM-2] – and discussions of community solar projects that had stalled: “It needs the acceptance of the appropriate of the property owners and board in each building and currently, they are not meeting because of the pandemic” [GOV-2].

Such statements suggest that, while energy communication takes multimodal forms, the sense of transparency, trust, and development of community bonds seems to require at least some physical proximity and face-to-face meetings where citizens can meet project managers and see models of proposed technologies.

The interviewees were encouraged by the uptick in solar installations, and strong links were observed between public communication actions and the benefits of solar, including the following claim: “One of the most important jobs we have in communication is to make people understand and communicate clearly and transparently, how the fact of having photovoltaic self-consumption has an impact on your bill” [COMM-1]. Others expressed concerns about the broader discourse around solar prosumerism as “a solar panel on the top of your building is not something that is done to you. You can also be part of that and decide to actively put a solar panel on your roof” [GOV-3]. Such statements suggest the value of communicating autonomy and choice and preempting concerns about further control of the system by utilities or government mandates. Another interviewee took issue with the common Spanish term for prosumer, *autoconsumo*, indicating a preference for “auto-generation” or “self-generation,” and added, “it’s easier to sell the energy transition with solar panels,” but “the first step is to improve the energy efficiency of the buildings and infrastructures” [EN-1]. The solar panel on a single home rooftop may be an effective marketing tool, but such icons are insufficient on their own and must be linked to broader, systemic changes. Concepts such as “autonomy” and “visual salience of solar panels” relate to our second research question and show how energy policy can be linked to individual actions. Such concepts would constitute subcategories of the “energy politics” and “information gaps” represented in Figure 3.

Figure 3. The connections between public communication and the common goal of empowering citizens.



The interview questions did not address transportation and none of the individuals or their projects were primarily focused on transportation; however, transportation became a key theme, with one interviewee explaining that “the most important thing and most effective would be to convince or to show people that the model of private car ownership is an unsustainable model” [AC-1], and another explained the need for better sidewalks and cycle lanes in their city: “Although we are not interested in specifically having e-cars, we prefer e-cars rather than diesel or other kinds of petrol. But we even prefer no cars” [GOV-2]. These comments reflect how professional discourse from intermediaries can touch on various aspects of energy systems.

As for individual energy use, one interviewee presented behavior change both in the first-person plural interrogative – “How can we use energy differently” [GOV-3] – and second-person directives – “instead of putting your washing machine, for example, at 8:00 in the morning, you put it at 3:00 in the afternoon when there’s not much demand” [Q2] [GOV-3]. Others indicated a more impersonal desire for “better understanding the problem of consumption patterns,” and generalized suggestions for “load shifting from peak hours to value hours” [EN-1].

Overall, the potential and challenges of enacting changes to the energy system through public communication efforts seem encapsulated by the following comment about the ideal process of convincing citizens to install solar panels or join an energy community: “It is better, and organic growth ... people get interested, they get some information, they think about it, more information. A process. But this is extremely slow, and we need to do the transition very fast” [AC-1]. This paradox, we hypothesize, remains the most pressing challenge for energy communication.

4.2. Primary rhetorical strategies: empowering citizens and systemic change

From the analysis, we found that energy communication to achieve awareness, engagement, and behavior change fed into what appears to be the most common objective of public communication: empowering citizens. Empowerment was an implicit justification for policy measures (i.e. “good price signals can guide efficient decisions from consumers” [EN-3]), for direct policy interventions (i.e. “citizens still do not understand their role ... how to become entrepreneurs or how to promote energy communities” [COM-1]) and general policy goals, such as facilitating local, non-profit ownership of energy infrastructure. Yet the explicit use of “empower” as a verb and “empowerment” as a noun was more often linked to educating the public and providing them with better information or technologies. Explicit use of the term was included in four separate responses:

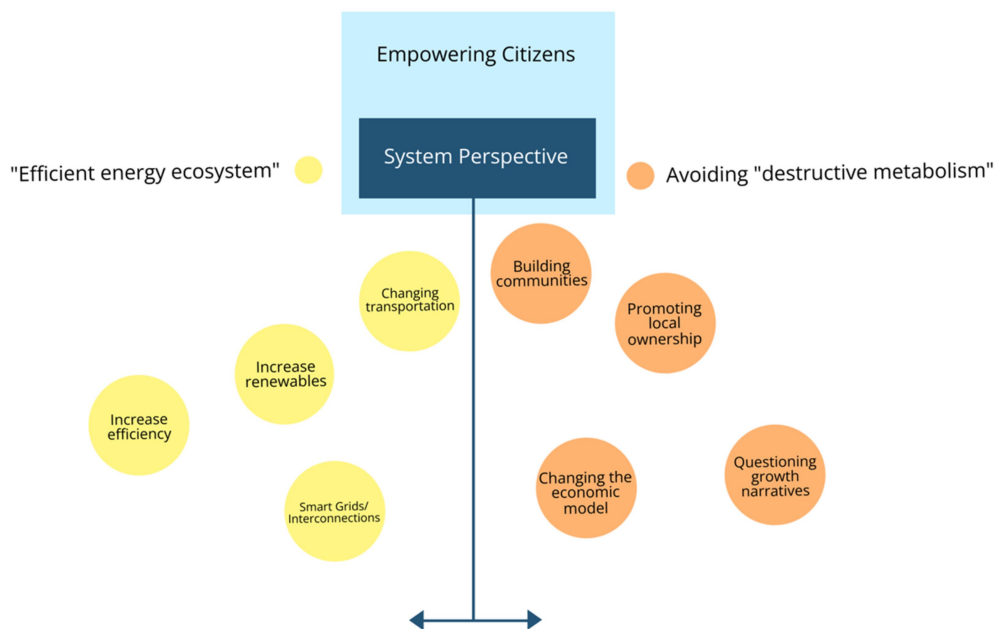
- “Giving them information, because it is also very important that the people feel *empowered*” [GOV-1]
- “Our aim was to provide different technologies ... to have a more democratic energy supply and *empower* citizens” [EN-1]
- “What is important is that we put the user at the center and that we *empower* him or her” [EN-2]
- “Reaching the people and *empower* them ... technically, legally, financially” [GOV-3]

To better understand this pattern in the collected data, we searched for recent research related to empowerment within the context of household energy choices (Whittle et al., 2020), participatory governance (Komendantova et al., 2021), and energy communities (O’Shaughnessy et al., 2019). The application of the concept has also drawn scrutiny, with questions arising about “empowered but powerless?” (Schwarz, 2020) communities and a push to further define and model community empowerment in energy transitions.

The subject’s responses and focused literature review suggest that, for intermediaries, empowerment (e.g. more choices for citizens, tailored consumption data for consumers, rebates for EVs, or home solar for customers) is instrumental for broader energy transitions. However, interviewees did not explicitly connect the concept of empowerment to any specific policy measure or technology. For instance, the interviewee who explained their goal to “put the user at the center and ... empower him or her,” [EN-2] seems to be echoing the language of the European Network of Living Labs (Garcia-Robles et al., 2015) and the recent public consultation on solar prosumerism in Spain: “placing the citizen at the center is one of the main aspirations of the energy transition” (MITECO, 2020b). Yet what “being at the center” means, in practice, remains unclear.

In addition to empowerment, another concept that emerged from our grounded analysis was the value given to systems and system perspectives. The features, designs, and outcomes of technological, social, and biological systems had a strong presence in the codes. After multiple rounds of coding and analysis, we also observed a split in how respondents positioned their systems thinking (Figure 4). While each of the six individuals who made frequent references to systems and energy networks each had training or a current position involved in engineering, three of them also voluntarily self-identified as activists (among other identities). From this observation, we were able to separate quotes about systems into two camps: (a) those assuming a goal of building what one interviewee calls a “sustainable energy ecosystem” [EN-2], and (b) those which implied that society must choose between at least two different transition pathways – one which is driven by large-scale technological transformation and other which features “less destructive energy metabolism” [AC-2] on behalf of humans.

Figure 4. The analysis of quotations coded for “systems thinking” revealed differences between the ways that systems are viewed in relationship to the energy transition.



In addressing the question of how intermediaries, specifically engineers within the sustainable energy sector contribute to public communication campaigns, our findings suggest their nuanced approach to technological and social systems. The engineers' understanding of the desired "sustainable energy ecosystem" [EN-2] led them to advocate for efficiency and transparency across various scales – domestic, community, national, and international. In the home, efficiency was proposed through behavior changes like reducing energy use and load shifting, within the community efficiency was associated with large-scale solar instead of rooftop installations, and, on the national and international level, efficiency emerged as an appeal for more transmission interconnections and smart grid technologies including real-time connections between system operators. This kind of infrastructure and coordination promises to unleash Spain's potential as a "renewable energy powerhouse of Europe" [AC-2]. Appeals for better system efficiency included nods to policy, with one interviewee suggesting that we must "motivate policymakers to take actions that are not only good for a specific type of customers but the overall system" [EN-3]. According to this view, innovative technologies and effective policy actions can make the system sustainable. The newer, more technologically efficient systems, it is assumed, can help achieve the previously mentioned goals of creating "a more democratic energy supply" [EN-1]. The strategic inclusion of policy appeals reflects the engineers' role as intermediaries capable of bridging the gap between technological innovation and policy action.

Alternatively, the academics who also identified as activists viewed current systems as inherently flawed. They supported new economic and political paradigms related to degrowth. One interviewee mentioned that "system dynamics enables us to put everything together and to build models that can put everything in context" [AC-3]. For this group, it seemed that economic systems were the primary threat to natural systems and the greatest obstacle to overhauling energy infrastructure. The same interviewee [AC-3] observed that decarbonization and a shift to renewable energy sources are necessary, but "if we don't change the way that the economy is ruled, we cannot do anything." Another interviewee suggested that, if they could offer one message to policymakers about the transition, it would be that "the energy transition is not just going to be a technological fix" [AC-1]. For these intermediaries, a critical part of their energy communication is related to conveying the fact that economic growth is incompatible with sustainability because "sustainability is about adapting to limits, sustainability limits, biophysical limits" [AC-1]. The third person in the academic and activist group explained that because of the "destructive metabolism" of energy supply and demand on a global scale, we face a major dilemma between two dominant kinds of transitions: (a) a transition away from fossil fuels, and which is focused on achieving national emissions goals through large scale deployment of renewable energy sources, (b) another transition which "makes sure that everyone has access to electricity, that empowers citizens, that results in an electricity sector that is not dominated by a few actors, but in which ownership is more distributed"[AC-2]. The delineation of the plural and diverse "energy transitions" suggests that the bridging role of academic intermediaries leans more towards integrating climate justice, policy deliberation, and the empowerment of citizens and social groups within the broader narrative of combating the climate crisis.

From these analyses, we observed that systems thinking and environmental language are used to communicate two different transition pathways – to build a "sustainable energy ecosystem" [EN-2] and to avoid "destructive metabolism" [AC 2]. Achieving either of these pathways, we concluded, would demand different, and possibly incompatible policy interventions.

Therefore, we reviewed recent literature and learned that, in European policy documents, "systems" and systems thinking are often identified "without defining energy systems, identifying their key dynamics, or demonstrating the mechanisms for

systemic transition” (Munro & Cairney, 2020). The differences between systems-as-material-infrastructure and as systems-as-social-assemblages are often glossed, somewhat destabilizing the cooperation required to change both physical and metaphorical systems. The casual associations and assumed relationships between systems thinking, decentralization, and energy democracy seem to be subsumed by a focus on technological innovations and fail to recognize other important aspects of socio-technological systems.

4.3. Primary bottom-up approach: communicating with and between energy communities

In response to the questions related to current policy or ideal outcomes for pending policy actions, participants touched on a range of themes: (a) a carbon border adjustment tax, (b) decarbonizing transportation, and (c) net metering. However, multiple interviewees explained the need for clearer legal frameworks for individuals and communities seeking to purchase and install solar panels and the need for expanded bottom-up approaches. They foresaw specific communication challenges:

- “The communication element is crucial. Not only on the technical side but on the legal side. How do you constitute an energy community?” [COMM-1]
- “Energy communities can only happen if there are some catalysts or people that actually are able to understand the challenge and bring forward initiative.” [GOV-3]
- “The challenge has more to do with how to organize a group, how to share different responsibilities, how to communicate rather than with a technical side.” [AC-2]

The responses suggest a continued gap between the policy objectives and bottom-up communication about and between energy communities. This can be understandable due to this being a relatively new figure. The framework for “energy communities” was outlined by the 2019 Internal Market Directive on Electricity (European Parliament, 2019), which specifically recognized a framework for *citizen* energy communities and *renewable* energy communities (European Parliament, 2019). In Spain, this process began with the “Law of self-consumption” and continued with subsequent regulation on collective consumption (López Prol & Steining, 2020). At the time of the interviews, new *comunidades energéticas locales* were just beginning to form.

The new laws and regulations related to community energy have the potential to reshape the energy landscape. However, based on the interviews with intermediaries, Spanish policymakers must offer strong policies and clearer guidelines for implementation. Then, intermediaries play a pivotal role in adjusting these existing frames by translating the complex processes and benefits of creating energy communities into language and concepts that are accessible to the local population. This translation process involves not only simplifying the legal and technical jargon but also framing the information in a way that resonates with the community’s values and priorities. Intermediaries utilize novel communication channels to convey these messages, tailoring their strategies to specific audiences – whether through formal presentations for potential investors or informal discussions within social networks. Furthermore, individuals advocating on behalf of the energy community, who may also function as intermediaries, employ diverse communication techniques to engage their networks, such as friends and neighbors. These communicative actions, while varied and potentially non-linear, highlight the intermediaries’ critical role in adjusting existing frames to highlight the practical steps and benefits of participating in energy communities. Adaptive communication strategies help close the policy-practice gap and reinforce the idea that addressing climate change “is not just going to be a technological fix” [AC-1]. In addition to technological innovation, intermediaries will facilitate more inclusive and informed participation in the energy transition, ensuring that the theoretical benefits of policy initiatives are realized in practice.

5. Conclusions

Through the application of grounded theory, this study provides a glimpse into how Spanish intermediaries view their communication roles and challenges within the broader landscape of Spain’s mainstream energy and environmental issues. As key facilitators between policymakers, industry, and the public, intermediaries are uniquely positioned to provide insights into communication challenges and opportunities. Given Spain’s recent surge of renewable capacity and the emergence of new regulations around prosumerism and energy communities, intermediaries’ communication strategies offer timely lessons for clarifying the value of public discourse and spurring engagement.

Our data was collected from interviews with eleven intermediaries. The modest sample size limited the perspectives we were able to draw from in our analyses; however, the small sample size did prove sufficient for grounded theory, as the constant comparisons of responses reinforced the valuable potential for exploring the social processes of energy transitions and revealed several new insights related to energy communication and two hypotheses:

- 1 Intermediaries bridge the gap between technical energy discourse and public understanding, contributing to the solidification of social processes necessary for sustainable energy transitions

2 Intermediaries view empowering citizens as a primary goal of communication, yet their own interpretations of the means and outcomes of empowerment are not explicit

3 Intermediaries adopt the language of systems rhetoric, but they struggle to explain how proposed changes will impact technological and ecological systems.

The top-down rhetoric of “systems thinking” employed by some intermediaries converges with discourse focused on economic growth and sustainability. However, there is a distinction between viewing energy systems as physical infrastructures versus social constructs. When these differences are glossed over, it can undermine efforts to influence policy or engage the public and thereby limit the agency of the middle-out approach. Therefore, these three hypotheses highlight opportunities for intermediaries to adopt more holistic communication approaches to translate policy and effect behavior change.

What do intermediaries see as the source and influence of empowerment and systemic change? Does systemic change come from the top-down rhetoric of utilities or other middle-out discourse from, say, environmental studies? Building on this baseline understanding, future research could expand the sample size and diversity of intermediaries and work to clarify intermediaries’ understanding of communication as a means of public empowerment and systemic change.

Finally, as the EU Clean Energy Package is implemented, continued focus on intermediaries’ messaging approaches could help unpack assumptions and identify opportunities to translate policy into action. Comparative analyses of a broader selection of intermediaries across contexts would clarify their agenda-setting role in shaping energy narratives. Helping intermediaries to improve the quality and quantity of easy-to-grasp examples also provides an opportunity to further maximize public engagement and, in turn, show policymakers how their decisions are affecting change. Of course, crafting such content requires time and resources; further qualitative, and quantitative studies might test how professional communicators could assist intermediaries in their “middle-out” approaches to communication. Ultimately, intermediaries’ unique vantage point offers under-examined opportunities for translating policy and spurring public engagement on interlinked issues of communication, climate, energy, and environment.

Disclosure statement

No potential conflict of interest was reported by the author(s [Q3]).

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Appendices

Appendix A. Codes and code groups generated by our grounded theory analysis can be downloaded from Zenodo at the following link: <https://doi.org/10.5281/zenodo.7488916>.

Appendix B. Survey questions can be downloaded from Zenodo at the following link: <https://zenodo.org/records/4879615>.

Appendix C. Raw data and other complementary material can be downloaded at the following link: <https://zenodo.org/records/4879748>.