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TITLE: A critical discussion of research on the social acceptance of renewable energy generation and associated infrastructures and an agenda for the future

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1. Introduction

Governments worldwide are attempting to streamline the deployment of centralized, large-scale, renewable energy and associated technologies (RET), in order to tackle climate change (e.g., Kyoto Protocol, 1998). However, that may not be an easy task; as when specific RET are to be deployed in particular locations, they are often met with opposition, namely from the local communities living nearby (Bell, Gray & Haggett, 2005; Wüstenhagen, Wolsink & Bürer, 2007). This has encouraged research to look into how local communities respond to RET, or the ‘social acceptance of RET’ (Wüstenhagen, et al., 2007). This area of research has been trying to uncover the reasons behind opposition, and, more recently, to overcome the NIMBY (Not In My Back Yard) explanation for that opposition (Bell et al., 2005; Devine-Wright, 2009). NIMBY has been extensively criticized for conceiving opposition to RET as a reaction that stems from the public’s ignorance, irrationality and selfishness, and alternative explanatory pathways and theories have been proposed (e.g., Machnagthen, Davies & Kearnes, 2016; Batel et al., 2016; Devine-Wright, 2009). However, as Fast (2015) and others have highlighted (Aitken, 2010; Aaen et al., 2016), those different reconceptualizations and approaches to understanding opposition to RET do not come without their own problems. One of those is that this field of research has been adopting mainly a positivist approach (even if not always – e.g., Ellis, Barry & Robinson, 2007; Futak-Campbell & Haggett, 2011; Phadke, 2011), even if it has not yet given evidence that such an approach is actually useful for enabling people to support RET and to promote more environmentally and socially sustainable and just societies (e.g., see Shove, 2012; 2010; Barr & Prillwitz, 2014; Batel et al., 2016; for discussions). Therefore, questions such as: are we departing from appropriate epistemologies? Are we using the most useful methods for collecting and analyzing data? Are we conducting

research that challenges or reproduces business as usual? Are we giving due voice to communities affected by large-scale renewable energy infrastructures?; are all questions that we have to start posing more often, for the reasons that will be discussed below.

Here, I will argue that there are limitations to the current research on social acceptance of RETⁱ, which need to be addressed and overcome given their implications to policy and planning regarding the deployment of RET. Such limitations concern the current research's overly local focus (see also Ellis et al., 2007; Batel & Devine-Wright, 2015) and its focus on the individual and related positivist assumptions, rather than on social practices – what Marres (2012) calls 'material participation'. I will then propose that solutions to overcome those limitations may lie in adopting a more relational and critical perspective, together with a social practice approach. I will specifically argue that, by failing to adopt such a perspective and approach, research on social acceptance of RET is constraining not only a better understanding of people's responses to, and relations with, RET, but also the democratization of those responses and relations -e.g., by failing to acknowledge them as public participation. I will also argue that theories of practiceⁱⁱ, with their relational underpinnings, could be helpful conceptually, for they will entail the adoption of that relational and critical perspective, and, more importantly, empirically, by leading research to focus on the examination of people's material practices and engagements with RET. Finally, I will suggest four avenues for future research that allow us to empirically adopt those perspectives.

2. From 'communities of the affected' to 'communities of relevance': A more relational and critical approach to the social acceptance of RET

The limitations mentioned above – the focus on the local and on the individual – can be better understood by using the concepts of 'communities of the affected' and

‘communities of relevance’, inspired by Marres (2012). Much of the research on the social acceptance of RET examines local communities and individuals living nearby RET as ‘communities of the affected’. This notion assumes that someone (developers, policy-makers, the ‘expert’ system, and the political system) is affecting and has the power to affect, whereas someone else (communities) is *only* being affected. It assumes, on one hand, that communities have no pre-existing interest in the issue at stake, and, on the other hand, that they cannot (or do not) actually engage and participate in the definition of that issue. This conceptualization of communities is very present in much of the research on the social acceptance of RET, and can be easily identified in three features: it tends to see responses to RET as important only when a specific RET is being deployed locally and ‘affecting’ people; it tends to see responses merely as reactions to a decision-making process that comes from the outside; and it tends to acknowledge responses as important only insofar as they allow RET decision-making processes to take place or not, with more or less ease (see also Aitken, 2010). In this vein, and as pointed out by Aaen and colleagues (2016), opposition to RET would be better seen “not as opposition to a specific development, but as a reflection of the many agendas and meanings that we as citizens possess at any given time” (p.577).

Borrowing from the work of Dewey and Lippman, Marres (2012) suggests that a conceptualization that might give a better account of the public as the object and subject of democracy lies in considering that, in scientific and technological controversies, the public is not only a community of the affected, but a community of relevance. This means that the public has a direct interest in the issue at stake, and is directly affected by it, but also that it is not affected, as it often cannot really participate in the debate because it does not have the necessary resources (specifically, the required ‘expertise’ held by those who have power) to define the issue at stake in an institutional way. As

Marres (2012) puts it, the public is thus simultaneously an insider and an outsider. In fact, this idea of community of relevance importantly also entails that people can and are engaging with RET in their daily lives, albeit outside arenas of institutional participation, as further discussed below.

In sum, looking at communities of relevance implies attending simultaneously to two dimensions of communities. One, as communities affected by issues with relevance to them and their everyday, to which they react as insiders, whether by opposing, supporting, or tolerating them at the micro-level of private, individual, relational and contextual local dynamics. The other, as outsiders, as communities that, despite being affected by issues that are relevant to them, are often excluded from the domains which define those issues, i.e., left out of the macro-level of public institutional arrangements, policy-making and big politics. To borrow Marres's (2012) formulation, to look into communities of relevance implies to espouse a "political ontology that does not assume the separation between *de facto* and *de jure* forms of issue involvement, but instead conceives issue specification as a wider material, technical, political and social process" (p.55).

Research on social acceptance of RET has focused mainly on the micro-level of people's relations with RET, not as much on the macro one (Batel & Devine-Wright, 2015), and even less so on both aspects simultaneously. However, as underlined by the concept of 'communities of relevance', we need an analytical perspective that can bring these two sides of communities and citizens, as both objects and subjects of democracy, together. To put it in other words, we need an approach capable of pursuing a more explicit and empirically aware relational approach that (i) outgrows the main focus on the local; (ii) allows for a more critical approach to our research; and, with it, (iii) outgrows the focus on the individual. Such an approach enables the linking of the micro

and the macro aspects of people's responses to the deployment of RET as communities of relevance, by examining engagement with RET as social practice and public participation. Let us take those three aspects in turn.

The importance of a relational perspective in studying people's responses to scientific and technological controversies is not new; it has, indeed, a somewhat long history (Callon, 1986; Latour, 2005). That said, research on social acceptance of RET has not yet integrated it fully. This has been recently pointed out in different ways and with respect to different domains of the social acceptance of RET. For instance, Devine-Wright (2013) has pointed it out regarding the study of place attachment, and their potential impacts in responses to new energy infrastructures. In fact, most research has been focused on examining their impacts on local place attachments, when impacts to and from place attachments at other scales, such as national and global, might be even more worthy of examination for purposes of better understanding responses to RET. Also, in the words of Chilvers & Longhurst (2016) regarding the conceptualization of public engagement in energy transitions in general, we need to “move beyond the compartmentalized tendency of existing approaches to attend to specific parts of ‘the system’ – for example the relative focus of deliberative process on sites of institutional decision-making, social practice theory's existing emphasis on domestic settings of everyday practice” (p.587).

The local focus of research on the social acceptance of RET can be seen as coming from the (assumed) diagnosis that it is at the local level that opposition to RET is found. Some theoretical proposals have also arguably contributed to reify that notion, as is the case with the very conceptualization of the social acceptance of RET by Wüstenhagen and colleagues (2007) in their influential and highly cited paper. In it, the authors separate community acceptance (“the second dimension of social acceptance of

renewable energy innovation”, Wüstenhagen et al., 2007, p.2685) from socio-political acceptance (“social acceptance on the broadest, most general level”, including public acceptance which “several indicators demonstrate (...) is high in many countries”, Wüstenhagen et al., 2007, p.2684/2685)ⁱⁱⁱ. However, the existence of such separation between community members and the public, or between the national and the local, is rendered artificial if one assumes a relational ontology (Latour, 2005; Whatmore, 2002) in which both national/local spatialities, or the public and local communities, are relationally intertwined, and therefore the same. Moreover, energy systems are also interconnected and interdependent, making it hard to define or separate local from national – or even global (Batel & Devine-Wright, 2017; Bickerstaff & Agyeman, 2009) – aspects of energy generation, supply and use, or to separate among public, local communities and individuals (Batel & Devine-Wright, 2015; Devine-Wright & Wiersma, 2013).

In short, adopting a relational ontology provides a better account of the complexity of these issues as processes and multilayered events, instead of incorrectly considering them as static and isolated phenomena. It also allows us to become more critical. Being critical means being aware and examining the impacts of what is said, how, to whom and by whom (Batel, Devine-Wright & Tangeland, 2013; also Kessi & Howarth, 2015) regarding both (i) the need for the deployment of RET and the location^{iv} selected for its deployment (Aitken, 2010; Batel & Devine-Wright, 2017); and (ii) how RET are deployed in the relation between so-called expert-political systems and the public, or, in other words, how democratic this relation is (Cotton & Devine-Wright, 2010; Barnett et al., 2012). In other words, it implies overcoming the positivist epistemology that has pervaded this field of research so far, with it assuming that research is political, as in promoting certain projects over others, often aligned with

hegemonic discourses that are nowadays embedded in neo-liberal capitalist logics (Barry & Ellis, 2011; Batel et al., 2016).

The need for critical perspective is argued by Batel and Devine-Wright (2017), who have shown how research on social acceptance of RET tends to endorse the underlying neo-liberal assumption that it is each individual's responsibility to accept RET, considering that responses like opposition and disagreement with RET have to be understood in order to be overcome. Additionally, research into community engagement (Cotton & Devine-Wright, 2010) can also often be seen to help perpetuate traditional power relations which chief purpose is to reach apparent consensus and moderation (for critiques see Barry & Ellis, 2011; Mouffe, 2013) and be instrumentally efficient (Aaen et al., 2016; also Hindmarsh & Matthews, 2008), rather than genuinely democratic. As noted by Aaen and colleagues (2016), considerable research in this area examines public participation processes in RET decision-making also with a view to improve them, so that opposition can be overcome.

In this area, as in others, being more critical may therefore imply a departure from 'acting within the [neo-liberal capitalist] system', as Mouffe (1992) puts it regarding feminism: "liberal feminists have been fighting for a wide range of new rights for women to make them equal citizens [to men], but without challenging the dominant liberal models of citizenships and politics" (p.371). The same tends to happen in the literature on the social acceptance of RET– it has made great progress in trying to give a better account of local communities' concerns and interests, and in making them as equal as possible to developers in RET decision-making processes, but without engaging noticeably with what that means and implies exactly, what is behind the deployment of RET, which models it is contesting or reproducing, and which interests it is serving, including the interests of research itself. Research in this area is often

oblivious of the ways in which neo-liberalism operates when it comes to environmental sustainability domain or democratic (and research) practices (e.g., Marshall, 2017); it frequently does no more than discursively re-articulating already existent discourses and practices (Mouffe, 2013, p.73) instead of ‘actually’ changing them (see also Walker, 2009; Swyngedouw, 2010).

In sum, it is crucial to consider that institutions, politics and ideologies are ontologically real (Parker, 1998) and, as such, that they influence and are influenced by the social actors and contexts with which they interact (Batel et al., 2016). In fact, as mentioned earlier, if we consider that communities ‘affected’ by RET are communities of relevance, we also need to consider that those communities, the public in general, are outsiders to that reality of institutions, politics and ideologies. How, then, to conduct research on social acceptance of RET in a way that adopts a relational and critical perspective and, in so doing, helps the public to participate in the institutional arrangements defining the planning of RET? As already suggested, one way to accomplish it might be to examine social practices (Marres’ ‘material participation’) with RET – in other words, to examine engagement with RET as public participation.

3. Material participation as public participation

As Marres says, “one of the merits of studying devices of material participation is that we can explore how they allow for particular connections between technology and democracy (...) it disrupts the assumption that public participation requires the disembedding of actors and actions from everyday life” (p.70/71). What Marres suggests is that with communities of relevance, despite the fact that people do not take part in issue formation in an institutional manner, they do it, as insiders and interested parties, at subjective and relational levels, in their day-to-day – therefore eventually

provoking change by interfering, in one way or another, with those ‘outside’ institutional arrangements. If research would also connect those levels (the insider with the outsider; the micro level of everyday practices with the macro level of institutional arrangements) by conceiving RET as devices of material participation, and material participation as public participation, through a relational and critical approach, we could be able not only to better understand people’s responses to RET, but also to contribute for more socially and environmentally just decision-making processes regarding RET.

Marres (2012) illustrates her case not by looking at RET, but by giving examples of demand side management practices. Smart meters are being deployed as participation made easy; they assume both the neo-liberal idea that it is each individual’s responsibility to take care of the environment, and the information-deficit and NIMBY hypotheses (presupposing that, unless energy conservation is made easy, people will not have the necessary ‘motivation’ and/or knowledge to take care of the environment^v). At the same time, while smart meters are being deployed and people are using and supporting, accepting or rejecting them, they are also engaging with them, and in an effortful way, as smart meters are making them aware of their energy consumption, the impact of people’s practices on the environment, and related political decisions and democratic rights. As such, as a community of relevance, engaging – or not – with smart meters *is* participating in the connection between technology and democracy (Marres, 2012). Eden and Bear (2012) have also argued the same point regarding anglers as environmental managers, stating that it is crucial to consider modes of participation that are not purely cognitive and discursive (as in formal public engagement processes) but are, instead, “empirical, pragmatic, relational (...) wherein power to effect environmental management is not solely formed by knowledge, expertise and inclusion (...) but relationally built through practice, and demands a wider

sense of ‘environmental engagement’ in which both talk *and* action form ‘the public’ ” (p.1200). Within this perspective, opposing, accepting, relating in different ways with any energy infrastructures – what Hiller (2002) would call ‘direct action’ or ‘outsider participation’ – is already to participate in decision-making within democratic societies^{vi}.

Now, we also need an empirical research strategy to go with this more theoretical research agenda. How to examine communities of relevance? How to adopt a relational ontology and critical perspective empirically? How to examine engagement with RET as democratic participation? Theories of social practice have been suggested as relevant in understanding people’s relations with technologies and environmental issues in general, and in connecting the everyday with the institutional (Spaargaren, 2011; Shove, Pantzar & Watson, 2012; Batel et al., 2016). More than that, they have been acknowledged as trying to adopt a relational approach (Shove et al., 2012) and also as criticizing and overcoming the individualist and positivist focus found on of much of the research on people-environment relations (see Shove et al., 2012; also Adams, 2014; Batel et al, 2016). However, although “this perspective is becoming increasingly popular for explaining consumption” (Schelly, 2016, p.745), production, which is arguably the most important side of the problem of energy in its relation with climate change (Uzzell & Rathzel, 2009), has been quite forgotten by research following theories of social practices (see Batel et al., 2016; Adams, 2014) – something which might be seen as yet another reflection of the lack of a relational approach in research on energy transitions. Moreover, theories of practice still have room for becoming more relational and critical, at both conceptual and empirical levels (Adams, 2014). Further developing, or focusing anew, on some of the avenues for research suggested below might help with that, and with rendering visible the everyday practices

around RET in their relation with institutional arrangements.

4. Four avenues of research for examining the social acceptance of RET as material and public participation

a. The history of RET and relations with RET from the global to the local:

Questions that should be asked more often include how do high voltage power lines, large-scale wind farms, and other energy infrastructures become necessary and how does that relate with local communities' needs, and with the appropriation and history of those infrastructures at the local level. As Walker and colleagues (2014) suggest, a better understanding of practices structuring environmental relevant practices involves asking where and why related technologies are being used – as they did in their research on the use of air conditioning. Other good examples in the field of energy demand are Anderson's (2016) work on laundry, energy, and time in the UK, and Carlsson-Hyslop (2016) historical account (1945-1964) of the promotion and adoption of electric heating in Britain. It would be very relevant for research on the social acceptance of RET to develop research agendas on the history of RET – of high voltage power lines, of solar panels, of centralization and decentralization – in general (Kander, Malanima & Warde, 2013), but more importantly in particular contexts, at national (see also Malone et al., 2016; Sovacool & Brossman, 2014; Sorensen, 1991) and mainly at local levels (e.g., Murphy, 2013; Freudentburg, 1992). In fact, the impact of the history of energy technologies on responses to RET has seldom been taken into account at local levels; from now on, research should perform the genealogy of specific types of infrastructures and particular examples of those in specific places. An exception to that paucity comes from Sherren and colleagues' (2016) analysis of the cultural imaginaries around already existent hydroelectricity projects in Nevada, USA. It shows how one such project was

contested by local communities at the time of its deployment, but which permanence is now being fought by those very communities, mainly due to the aesthetic and recreational value it has generated in the area. It would thus be pertinent to look into already existent RET, placing them center stage, and examine their own life course and how did and do people relate to them. This would also include the analysis of the history of the place, of the traditions associated with it, and of people's relations to them. This would allow to take into account if and how both the outcomes and the processes of building places, e.g. languages and cultural traditions (Murphy, 2013) or specific inter-group relations (Batel & Devine-Wright, 2017), also contribute for shaping social practices with RET. An example of the latter is given by Batel and Devine-Wright (2017); they showed that one important dimension shaping the responses of some local communities in Mid Wales to the deployment of new RET in the region was the fact that those RET would be giving away electricity produced in Wales to England, after a past (and present – Ellis et al., 2013) history of England exploring, 'raiding and milking' Wales.

Additionally, adopting life-place trajectory narrative approaches that delve into if and how people related with RET and associated types of infrastructures throughout their own life courses might also show to be useful (see Bailey et al., 2016).

In turn, focusing on these new questions might imply using new methods or reviving old ones. An intuitive method that should be used more often in this area of research is ethnography, specifically, participant observation entailing field work – “in its most characteristic form ethnography ‘involves the ethnographer participation...in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions’ (Hammersley & Atkinson, 1995)” (O'Reilly, 2005, p.2). As Flick (2009) puts it, some approaches within qualitative research emphasize how

practices can only be accessed through observation; interviews allow us access to the description of practices, but not to the practices themselves (p.137). Moreover, this form of ethnography can also give us access to subtle and implicit ways to resist change that are seldom expressed verbally, but are displayed in everyday actions and habits (see Batel et al., 2016). Methods that access narratives, in turn, can help us understand how meanings over social objects are negotiated and so they might be more helpful for understanding current and anticipated relations with RET, as discussed below.

b. Present practices with RET and/in their networks of landscapes and other objects: Analyzing practices with RET also involves examining people's everyday practices with the objects – material (e.g., cables and soils) and symbolic (e.g., place attachments) – networked with and (co-)impacted by RET (for an example, see Aaen and colleagues, 2016). This is already done for research where theories of practice are used to examine people's everyday practices with smart meters and associated household electric appliances (e.g., Hargreaves, Nye & Burgess, 2010; Gram-Hanssen, 2010) but has only tentatively been done for RET (e.g., Schelly, 2016). Examining how RET are 'handled' and mobilized in practice, how they are observed, examined, measured, admired, and drawn, by people (Rinkinen, Jalas & Shove, 2015, p. 2; see also Allen & Jones, 2012; Devine-Wright & Devine-Wright, 2009) are all new ways of examining people-RET relations. Questions to be more frequently asked are: How do people use specific aspects of the place where they live and of the specific sites affected by RET? How do they see RET fitting and/or not fitting with those places and practices? How do practices of consumption (e.g., smart meters) reflect practices with RET? To examine these practices, it might be useful to follow Rinkinen's and colleagues (2015) suggestions of analyzing the three stages of the relation between people's practices and the objects around them. First, examining people's perception,

recognition and naming of RET and important associated objects (e.g., a relevant specific set of trees close to where a wind farm is going to be built). Second, analyzing people's "accounts of practical, on-going and responsive problem-solving" (Rinkinen et al., 2015, p.8) – this might mean people protesting against a RET to be deployed, using an already existent RET as the theme of a school drawing contest, or using fields around the power line to play football with friends because they are wide, empty and free of people. Third, examining people's evaluation of RET, which might entail talking with people about their beliefs, ideas and emotions regarding practices with and around RET, by, for instance, adopting a phenomenological approach to the understanding of responses to RET. In this regard, collecting and analyzing data through interpretative phenomenological analysis (Smith & Osborn, 2008) might be very relevant to uncover not only the socio-political dimension of responses to RET, but also their experiential and psycho-social dimension (Lertzman, 2015).

A focus on practices might also contribute to expand the focus of research on the social acceptance of RET beyond binary thinking – research often considers that people either oppose or accept RET, that people see RET as either fitting in a place or as not fitting there (e.g., McLachlan, 2009; Devine-Wright, 2009; Bailey et al., 2016), but rarely both, or none, or other responses. However, more often than not, and as suggested by the well-known conditional acceptance hypothesis (Bell et al., 2005), people see RET both as positive and negative, and different types of responses to RET can be found (Batel et al., 2013).

To uncover these ambivalences and relations, new methods that combine verbal data with other data (e.g., visual data) present an enormous potential for better understanding people's responses to RET and to their multidimensionality (Batel et al., 2016). One example is walking interviews (Carpiano, 2009), to get people to talk about

their daily routines in and around their community, and about their relation with certain spaces and places, views and landscapes, while they actually walk across them (see Murphy, 2013; also Allen & Jones, 2012). Another example is diaries (e.g., Latham, 2003) - even if they are verbal-only data collection methods, they can be very useful and have seldom been used in the analysis of the supply side of energy systems.

It is nevertheless crucial to stress that the use of qualitative data collection methods, in and of itself, is not enough to access material practices based on a critical and relational perspective; adequate data analysis methods are needed, too. In fact, several studies using qualitative data collection methods quantify the analysis of the data collected (e.g., Sherren et al., 2016; Fast, 2015), with it often losing very relevant information and insights for understanding people's responses to RET, their relationality and material implications. It is thus equally important for research in this area to use more often than it currently does rhetoric discourse analysis and thematic analysis (Batel & Devine-Wright, 2017), narrative analysis (Macnaghten et al., 2015), interpretative phenomenological analysis (Smith & Osborn, 2008), and other types of qualitative data analysis that are *by definition* socio-constructionist, critical and relational.

A very good example that materializes some of the aspects discussed throughout this paper so far is Murphy's (2013) study about Gaelic communities' responses to new wind farms and a new gas refinery. Murphy argues that "Gaelic history, culture and language have shaped their concerns in important ways" (p.801), and therefore delves into Gaelic poetry, literature and painting, as well as into the language and history of those communities, while doing a 1500km walk along the coasts of Ireland and Scotland where the projects were being developed. While walking, the author spoke with the people involved, and said that "the walk encouraged me to contextualize their

concerns and to make connections along the coastline” (p.802; see also Allen & Jones, 2012, for another example).

c. The future of RET or RET in the future: Exploring people’s imaginaries, dreams, utopias or dystopias about RET and the objects and practices networked with them. What alternatives, if any, do people conceive or imagine (see Wagoner, Luna & Awad, 2016)? Or, as Sovacool and Brossman (2014) discussed when looking into energy transitions from the past, what are people’s fantasies and expectations for energy futures, future energy technologies, landscapes, and places? How do these reflect or disrupt current institutional and political arrangements? (Phadke, 2011) And how are these being re-presented in different media, by different actors, plastic artists, novelists, film-makers, and other sources of imagination and creativity that often look into the future? The Romantic movement of the 19th century has had a crucial role in shaping re-presentations of the countryside as a rural idyll, a place of retreat and contact with pure nature/us (Woods, 2005; Halfacree, 1995). These re-presentations have been taken up and further reproduced by the planning system and other institutional arrangements in the last century, and are now seen as being put into question by policies and planning systems fostering RET (see Batel & Devine-Wright, 2017; Short, 2002). Do artistic movements – in cinema, urban cultures, ... – still play a role in creating and shaping people’s perspectives on these issues? Which ones? How? Recent movements which re-present industrial landscapes as heritage and cultivate them as places to be admired and used in balance with other, ‘greener’ usages of the space (e.g., High Line Park in New York (USA); Duisburg Nord in Germany) are cases in point for thinking about how to better relate RET to different types of landscape, both rural and urban (e.g., Adelaja, et al., 2010).

For exploring those imaginaries and future scenarios, photo voice (Kessi, 2011) might be a useful method. It involves asking people to take photos of what they think is good and bad in their community, and then discuss those photos in focus groups to tackle people's engagement with RET, but also with other issues in their community that they want to change.

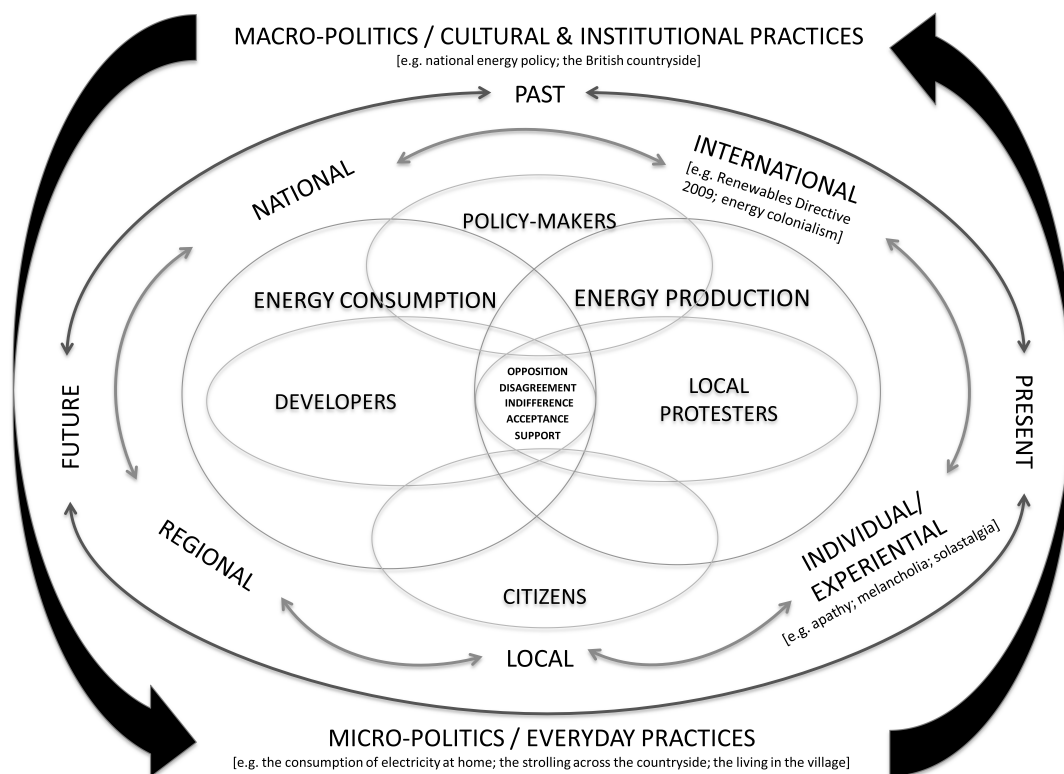
d. The co-constructed nature of past, present and future relations with RET:

It has been abundantly suggested that local communities' responses to RET are not only 'theirs', rather co-constituted in the relation between them and developers, policy-makers and other stakeholders (e.g., Barnett et al., 2012; Batel et al., 2016; Chilvers & Longhurst, 2016). However, this assumption has not yet been extended to the different subject positions that any representative of those groups occupies. In other words, in examining people's past, present and future practices with RET, it would be useful to take from socio-psychological theories an important insight and a consequence of adopting a relational approach: that developers, policy-makers, citizens, community members, local authorities, members of NGO's, politicians, occupy different and interconnected subject-positions, in different contexts, at different and the same times. Developers, decision-makers, others often deemed as the experts, the researchers themselves, are also the public, are also citizens, and, as such, are also insiders and outsiders, too (Marres, 2012). Or are they not? In what ways are they aware of it? How do they engage with the resulting tensions? It is crucial to recognize that knowledge is social and political in nature; different subject-positions are occupied by the same person, but can also be mobilized by her – at least to some extent or in certain contexts (Batel et al., 2016; Castree, 2014) – to fulfill or contest certain projects (e.g., Batel & Devine-Wright, 2017; Jovchelovitch & Gervais, 1999).

5. Material participation as public participation

The analysis of people's practices in the manners suggested allows us to better understand people's material participation in environmental issues at a more micro level. But the analysis of their responses through those methods and research also allows – arguably, more directly so (see Adams, 2014) – to identify and understand what people need and want regarding more macro RET-related issues; in other words, to examine people's public participation, i.e., their practices in RET-related decision-making (see Figure 1).

Figure 1 – Towards a relational and critical framework to understanding people's responses to RET



Theories of practice have been criticized for failing to conceptualize individuals as being aware of environmental problems and of the actions they (do not) take

regarding those problems (see Adams, 2014). That criticism is all the more apropos in that, when people are inquired as to their practices with RET and/or their thoughts and beliefs regarding them *via alternative methods* (focus groups, photovoice), and, similarly, when observing people's actions with and around RET, it becomes readily apparent that they are aware of the issues, and that they are active about them – if not to contest them, at least so as to be able to follow the pertinent norms (see Batel et al., 2016). As suggested earlier, most research on the social acceptance of RET tends to separate the two dimensions: public responses to RET (only considered as such when the response is one of acceptance) and public participation in RET – with participation often seen as predicting acceptance (e.g., Rau, Schweizer-Ries & Hildebrand, 2012). In this sense, responses to RET, in and of themselves, are very rarely already considered as participation.

This could be seen as associated with, among other factors, the positivist tradition in social sciences, where some research on the social acceptance of RET looks for guidance regarding which theoretical and technical devices to use in order to analyze people's ideas and beliefs about RET. That tradition, in turn, is often characterized by ideas of people's unreflexivity and unawareness of the research being conducted or of the research ideas behind them – which is not only often taken for granted, but even considered as desirable (Korn, 1997). In other methods (questionnaire surveys, interviews, etc.), the assumption that the 'true' purposes of research should not be disclosed to participants beforehand, and/or that a 'truth' will only be revealed, to researchers and participants alike, post data analysis, has also often been in the background. Imprints of this mindset are still visible in research on the social acceptance of RET, particularly in the fact that research is often developed (and/or presented) for purposes of contributing to make decision-making processes over RET

fairer, or mitigating local communities' concerns with RET, while remaining seemingly oblivious of the larger socio-economic and political contexts – and related power relations (Barry & Ellis, 2011; Mouffe, 2013) – that shape those very decision-making processes or mitigation measures. This, in turn, obstructs the appropriate grasping of people's material participation as public participation. In line with Callon and colleagues (2009), it might prove useful to take scientific and technological controversies over social acceptance of RET not as something to avoid and eliminate, but instead let them “reveal their fecundity, their fertilizing power (...) to enrich political debate” (p.9). It is therefore important to assume in a more widespread fashion that participants are co-producing the research and its results with us, and that they are aware and reflexive about the world around them – when it interests them and in the ways that it does (Kessi & Howarth, 2015; Adams, 2014). It is also worth remembering Walker and colleagues (2010) when they say that the “potential influence of public subjectivities on sociotechnical change is realized not only through moments of active participation and protest, but also through ‘the public’ being imagined, given agency, and invoked for various purposes by actors in technical-industrial and policy networks” (p. 931). The same could be said of academic research networks, which should give more thought to their own practices and to the publics they imagine, to which actors and agendas they give voice to, and to how their choices impact on energy transitions. Finally, one of the main ways to make people's practices with RET more democratic – and acknowledge them as public participation – might be to give voice, examine and engage with responses to RET other than opposition (Batel et al., 2013; Fast, 2015).

6. Conclusions

This paper aimed at critically discussing the literature on social acceptance of RET. While this research has been increasingly criticizing NIMBY representations as explanation for the high levels of local opposition to those infrastructures, it can nevertheless be seen as still retaining a shadow of those representations (e.g., Sherren et al., 2016). It has been argued that two chief limitations of current research on social acceptance of RET are its local focus, and its focus on the individual *as being* the ‘source’ of opposition to RET. It was then suggested that one way of overcoming these limitations was for research on social acceptance of RET to adopt a more relational and critical perspective, together with a focus on social practices/material participation with and around RET as public participation in RET decision-making. That approach is embedded in the concept of communities of relevance (Marres, 2012). In order to conceptually and empirically pursue this proposal, I suggested four avenues that future research on social acceptance of RET should further examine: 1. The history of energy associated objects in themselves and of people’s relations with them at different scales; 2. Present practices with RET and/in their networks of landscapes and other objects; 3. The future of RET – what are people scared of? What do they long for?; and 4. How past, present and future relations with RET across different spatial contexts create diverse and plural subject-positions for each individual in relation to RET. Further examining and following these theoretical-methodological pathways, while assuming a relational and critical perspective, can importantly contribute to overcome the focus on the local and on the individual, while grasping, observing and examining social practices. In turn, this can help us with revealing material participation *qua* public participation in planning and RET-related decision-making processes. Developing these lines of research would allow research on social acceptance of RET to focus on the everyday praxis of change, as a way of “making tractable two important constraints on

democracy in technological societies: the busyness of everyday life and the complexity of issues” (Marres, 2012, p.136) – or on how the micro-contexts of everyday practices reflect, contribute to and contest the macro-contexts of policy-making and institutional practices around RET.

Having said that, one should not eschew from the fact that this work has its own limits: it does not delve into the specificities of different types of RET, or into how this agenda might be pursued so as to specifically take that into account, and it leaves out other factors, such as socio-geographical contingencies. It should not be read as intending to further reify the distinction between the consumption and production sides of energy, nor to blur their relevant applied and conceptual distinction – the approach here proposed claims that these dimensions are relationally and critically interwoven, and that research should examine them as such.

Nevertheless, what this work does suggest is that we might need a paradigmatic transformation of research on ‘the social acceptance of RET’, which entails cutting down old habits and, namely, old ways of thinking and doing research that tend to reproduce business as usual and conceive individuals as rationally impaired (see Partington, 2017, on Thaler’s Nobel Prize). Adopting instead a relational and critical approach might make us feel uneasy at first, as it eventually implies challenging our previous work, asking radically new questions and devising and using unfamiliar methods for collecting and analyzing data. But if we can start to at least discuss these questions and approaches, we might be able to soon start building a field of research which is a more active actor in societies and more useful in it, namely, by making them more democratic.

In terms of potential policy and planning implications, one such implication would be that, by virtue of designing research approaches that are more relational- and

critical-oriented when responding to governments' and companies' requests, research itself would be pressuring those actors to also be more relational and critical in their agendas. This will arguably make developers, policy-makers and related actors more aware, emphatic and knowledgeable of other alternatives and futures for energy transitions, which, incidentally, are also theirs, as citizens. This may sound somewhat naïve, but one should bear in mind that it was only quite recently that research on RET started to pay more attention to the role that the re-presentations of 'the public' held by developers, policy-makers and institutional practices play in the public's opposition to RET (Cotton & Devine-Wright, 2010; Barnett et al., 2012). Also quite recent is the research's attempt to make local communities have equal power to political-expert systems often oblivious of the larger socio-economic and political contexts that constrain that equality. That, in turn, clearly suggests that more attention should be given to examining the practices of developers, policy-makers and the like, and their possibilities for change (see also Marshall et al., 2017; Uzzell & Rahtzel, 2009).

Equally, an additional impact would be the further empowering of citizens (Aitken, McDonald & Strachan, 2008). If, in the course of our research, we engage with citizens in a way that represents them as active and aware political actors (Batel et al., 2016), that will likely contribute to more active forms of citizenship that, in turn, will be in a position to demand better planning and policymaking.

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ⁱ The focus will lie mainly on the social acceptance of RET as public/community responses to RET.

ⁱⁱ One should note that there are different versions of theories of practice (see Spaargaren, 2011, for a discussion), some more in tune with a relational and critical perspective than others. I am here following the ideas put forward by Elizabeth Shove and colleagues on social practices (e.g., 2012).

ⁱⁱⁱ And yet, somewhat underlining their interconnection: “socio-political acceptance, community acceptance and market acceptance. All three, sometimes interdependent categories of social acceptance” (p.2684).

^{iv} As mandated by international treaties often disconnected from situated knowledge and specific local and national, cultural and institutional conditions (Castree, 2014).

^v Marres (2012) points out that this is quite clear in the influential report *The Limits to Growth*, and has also been embedded in some psychological theories (e.g., Spence, Poortinga & Pidgeon, 2012).

^{vi} Whereas there are clear differences between everyday practices with smart meters and with large-scale energy production infrastructures, there are also similarities (e.g., they are material objects, which alter spaces and places, dreams, expectations, feelings, habits, ...) that can be fruitfully explored by research on the social acceptance of RET.