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Energy citizenship
for a sustainable future

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1 Abstract

In the last decade, the concept of energy citizenship has attracted increasing attention, both among scholars and practitioners. The term comprises visions of more decentralised and democratic energy systems in which previously passive consumers can become active energy citizens, engaging and taking responsibility for energy production and consumption. One of the realms in which citizen engagement with energy issues is observed is social media. Indeed, online platforms are new arenas in which energy-related energy public issues are discussed and public support and/or opposition to energy projects is mobilised. However, the energy citizenship literature has paid little attention to social media as a realm where energy citizenship is practised. This paper aims to fill the gap by providing empirical insights about how energy citizens engage in social media-mediated public energy dialogue across Europe. Drawing on the results from a netnographic study, the paper maps and discusses energy citizenship enactments by looking at different engaging themes in four social media platforms (Facebook, Instagram, Twitter and YouTube) in four countries (Norway, Austria, Germany and Italy). Results point to four main themes being discussed in social media: nature protection, wildlife, health, and recreation activities; aesthetics; energy production; and the politics of wind energy.

Keywords: energy citizenship, social media, wind energy, participation, enactment

2 Introduction

We are currently immersed in a series of comprehensive and complex socio-technological changes, often labelled the 'energy transition', affecting energy production, distribution and consumption. From global to national and local levels, considerable efforts are now underway to enable low-emissions energy systems. Yet, the decarbonisation of energy systems will bring along not only considerable technological but economic, social and political challenges to consumers, producers and public authorities (Henderson & Sen 2021).

Particularly in democratic societies, societal engagement and public participation are often highlighted as critical for the successful uptake of energy transition policies and technologies (Armstrong, 2021; Foulds et al., 2022; Ingeborgrud et al., 2020; Sovacool et al., 2020). For instance, the lack of local support is now considered a major barrier to the deployment of wind parks in western societies (Boudet, 2019; Rand & Hoen, 2017). Moreover, components of the new smart grid, such as smart metering, have faced opposition due to concerns about security, privacy and potential health impacts (Hess & Coley, 2014). On the other hand, different forms of public engagement with energy issues (e.g., mobilised publics, social movements and grassroots efforts) can serve a critical role in accelerating the pace of change and challenging powerful status quo systems (Portney & Berry, 2016).

The role of the public in the transition has been scrutinised from different angles and different strands of Social Sciences and Humanities (SSH) literature (Foulds et al., 2022; Ingeborgrud et al., 2020; Sovacool et al., 2020). Earlier works were oriented more toward public acceptance and acceptability. Yet, more recently, the attention has shifted towards public engagement and participation issues (Armstrong, 2021; Chilvers et al., 2018;

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Chilvers & Longhurst, 2016; Ingeborgrud et al., 2020). Researched topics include, among others, enablers and constraints for public engagement in the development and implementation of renewable energy technologies; decision-making processes and people's participation in these; and place-specific interventions (Ingeborgrud et al., 2020).

In the last decade, the concept of 'energy citizenship' has attracted increasing attention among scholars and practitioners. The term has emerged as a response to the EU's vision of citizens having a central role in the energy transition (EU Commission, 2019.), and reflects a vision of more decentralised and democratic energy systems in which previously passive consumers can become active energy citizens, engaging and taking responsibility for energy production and consumption. Many scholars use the term to empirically examine the different ways in which citizens engage with the energy transition (Ingeborgrud et al., 2020; Wahlund & Palm, 2022). The growing body of energy citizenship research examines new ways of participating, organising, preparing, inviting and empowering people and collectives to participate (Ingeborgrud et al., 2020).

One of the realms in which citizen engagement with energy issues can be observed is social media. Indeed, online platforms are new arenas in which energy-related public issues are discussed, and public support and/or opposition to energy projects is mobilised (DellaValle & Czako, 2022; Warren et al., 2014). This makes social media a suitable medium for scrutinising these social interactions, conversations and visions (Li et al., 2019). However, the energy citizenship literature has paid little attention to social media as a prism for understanding today's "energyscape" (Li et al., 2019), i.e., one of the realms where energy citizenship is practised (Boudet, 2019).

This paper aims to fill the gap by providing empirical insights into how energy citizens engage in social media-mediated public energy dialogue around wind energy (WE) across Europe. Drawing on the results from a netnographic study, the paper discusses results from the mapping of engaging themes in four different social media platforms (Facebook, Instagram, Twitter and YouTube) in four countries (Norway, Austria, Germany and Italy). The study aimed to address the following questions:

- Who is engaging in energy issues in social media in each country (e.g., citizens, politicians, public authorities, business sector representatives, influencers, and other opinion leaders)?
- How are citizens and other stakeholders engaging in energy issues in social media in your country (topics, patterns of participation, types of engagement, netiquette)?
- What common themes are usually discussed in social media in your country?
- What kind of energy transition-related controversies are discussed in social media in your country?
- Which arguments are raised by whom in the previously identified controversies?
- Are there substantial differences across social media platforms?

Knowing more about how people use social media to discuss energy-related topics and/or organise themselves can contribute to a better understanding of the myriad of public responses, which deserves increased attention by the scholarly literature (Ingeborg et al., 2020). This will in turn contribute to more in-depth knowledge about the different roles people can take regarding the energy transition.

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The paper continues as follows: the next section summarises previous relevant literature. Then, the theoretical framework informing this study is presented. The methodology is explained in the next section. Then, we present and discuss findings from the analysis of engaging themes across different countries, and we conclude by considering implications for future research.

3 Energy citizenship in the age of social media: Public engagement in energy debates as participation

In the last couple of decades, social media forms based on active participant engagement have become commonplace (Kember & Zylinska, 2012; Mandiberg, 2012). Nowadays, social media is a major communication platform used by all types of actors alike, including citizens, politicians, businesses, government agencies, etc. In recent decades, social media has been increasingly considered a way to directly participate in public affairs. Such online civic engagement activities can be both individual and/or collective. They comprise a wide arrange of different practices, ranging from sharing links, news, photos or videos to raise awareness of certain social issues, to online coordination of activities to act against those social problems, such as civic events, charities and protests (DellaValle & Czako, 2022). Therefore, social media can help citizens become heard, making it an empowering tool to take and demand action on various social issues (Warren et al., 2014). In this context, social media can become a channel for citizens to enter and shape the public debate on energy, and make their voices heard also concerning their energy needs, for instance, on energy poverty and energy justice issues (DellaValle & Czako, 2022).

Scholarly literature looks at the role of social media on public perception and acceptance, as well as socialisation processes in techno-scientific democracies (Fergen et al., 2021). Within science and technology studies (STS), it has been suggested that voiced concerns in online media create useful opportunities for tracing how actors organise around issues in a controversy (Rogers & Marres, 2000; Venturini, 2010). For instance, by examining digital traces left by actors online (e.g., search queries, hyperlinks, comments, profile data, likes, friendship connections, etc.), many have scrutinised social media as a platform for policy discourse in the hotly contested realm of energy transitions (Corbett and Savarimuthu, 2022). In the case of wind power controversies, Munk (2014) describes concerns that emerge concerning particular turbine sites, basing this on users' interactions on digital platforms.

Social media, especially Facebook, is often used for a wide array of civic engagement activities, including voting for certain candidates in election cycles and engaging in political networks of activism (Valenzuela 2013). Some of the most widespread forms of engagement are the dissemination of news and the expression of support (Nekmat et al., 2015). The role of social media on local conflict and mobilisation has also been studied. For instance, Reusswig et al. (2016) examine opposition to a particular wind farm site in the state of Baden-Württemberg in Germany. Their findings point to very

asymmetric dynamics when it comes to engagement. While leading critical individuals and others opposing initiatives were very active in advocating and posting their views and criticising other positions, supporters of the wind park remained silent (Reusswig et al. 2016). Barrios-O'Neill and Schuitema (2016) have shown that ignoring social media platforms creates an informational blind spot for policymakers, implementers and influencers. In the same vein, Borch et al. (2020) argue that social media debates about local wind power projects can be an opportunity for negotiated agreements to elicit public-spiritedness and engaged citizenship.

Despite this growing interest in understanding the interplay of energy and social media, the energy citizenship literature has paid limited attention to social media as a realm for participation. At the same time, several scholars have argued that there is yet no clear definition of energy citizenship in the scholarly literature (Lennon et al., 2020, Biresselioglu et al., 2021). Some authors assume that the concept of energy citizenship refers to individual or collective forms of 'prosumerism' and/or sustainable production and consumption practices as tools with which citizens contribute to the energy transition using a form of self-management (Wahlund & Palm, 2022). In the SHH energy literature, there are several ways to conceive the concept of energy citizenship, which is dependent on how participation in energy-related issues and decisions is considered. Thus, energy citizenship is the result of a combination of a wide variety of factors at the individual, collective and institutional levels, including environmental consciousness and awareness, technological knowledge, psychological and behavioural factors at the individual level, structural and organisational factors, economic factors, social factors, individual climate perceptions, financial factors, gender-related issues and policy-related factors (Biresselioglu et al., 2021). In this paper, energy citizenship is understood as enacted and relational, i.e., a result of what certain actors do. Doing so, this paper aims to contribute to filling this gap by providing empirical insights into the wide array of themes in which energy citizens engage in social media. The theoretical framework informing the study is further explained in the next session.

4 Theoretical underpinnings: From public acceptance to participation - adopting an enactment approach to energy citizenship

Earlier works within the SSH literature were more oriented toward public acceptance and acceptability. Yet, more recently, the attention has been shifted toward public engagement and participation issues (Armstrong, 2021; Chilvers et al., 2018; Chilvers & Longhurst, 2016; Ingeborgrud et al., 2020). Several works have shed light regarding, for instance: enablers and constraints for public engagement in the development and implementation of renewable energy technologies; decision-making processes and people's participation in these; and place-specific interventions (Ingeborgrud et al., 2020).

This paper builds on the recent dialogue between sustainability transition theories and Science and Technology Studies (STS) (Chilvers et al., 2018; Chilvers & Kearnes, 2020; Chilvers & Longhurst, 2016; Skjølsvold et al., 2018). The paper adopts a constructivist and relational perspective on public participation, which allows us to move beyond

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popular 'residual realist' notions of participation (Chilvers & Kearnes, 2016). Chilvers & Kearnes (2016) have criticised the rigidity of mainstream approaches to public engagement with and participation in energy transitions, pointing to these being limited to specific, fixed, and normatively pre-given models of participation (e.g., deliberative, individualist), the public (e.g., as innocent citizens, consumers), and definitions of the issues at stake. Instead, the authors invite us to approach participation as an emergent and co-produced phenomenon in itself and to pay particular attention to the circumstances of its construction, performance, productive dimensions and effects (Chilvers et al., 2018; Chilvers & Kearnes, 2020; Chilvers & Longhurst, 2016; Skjølsvold et al., 2018).

To do so, the paper makes use of the enactment concept, understanding energy citizenship as something that is enacted, meaning that different actors, institutions and devices enact or embody different interpretations of what the energy transition is and should be. Therefore, an energy citizenship enactment in a given time and place is the contingent outcome of a particular understanding of which devices enacting which principles matter most. The energy citizenship-as-enacted approach stresses the unfinished and open-ended character and potential of what we call 'energy citizenship'. It helps us to shed light on different modes of participation and different ways of being an energy citizen.

We argue that approaching energy citizenship as enacted can help us capture a wider and more dynamic sense of the possibilities and pitfalls of public participation than what we find in, for instance, most of the H&SS literature. Thus, the question in this paper is not what counts as energy citizenship, but rather: how do people enact energy citizenship? Approaching citizenship as a relational process broadens our view and deepens our understanding of the multiplicity of existing practices (Asen, 2004).

5 Method

This work has been done as part of DIALOGUES, a project funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101022585. This paper is the result of Task 3.4: 'Public Opinion in the digital age: A netnographic analysis', which involved five different DIALOGUES partners, namely NTNU Social Research (NSR, leading the study), Climate Alliance Italy, RomaTre, the Energy Institute and the Potsdam Research Institute. The first author was in charge of the design and coordination of the study, as well as the analysis of results and preparation of the manuscript.

The data was gathered by conducting a netnographic study, consisting of a content analysis of wind energy-related content in social media (Facebook, Instagram, Twitter and YouTube) across four different countries (Austria, Germany, Italy, and Norway). For that purpose, each team created new accounts on each of the four social media platforms. To facilitate the coordination of the work and the comparability of results, common protocols with detailed instructions for data gathering and description of results were outlined by NSR. The protocol was tested by all partners and adjusted according to the received feedback.

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The search strategy involved searching for relevant content by using 'wind energy' in every language as a keyword in each of the social media platforms. Content published before 2015 was not registered. This process allowed us to gather data concerning:

- Date of the contribution
- Source
- Type
- Style/ Netiquette
- Administrator/s-author/s
- Topics
- Engagement
- Controversy
- Other comments

Researchers involved in this task met regularly to address challenges, find common solutions, discuss preliminary results and ensure progress. Data were gathered during the Spring of 2022.

Since netnography is a very time-consuming methodology (Kozinets & Nocker, 2018), we limited the data-gathering efforts according to available resources. Every partner used a similar number of working hours to register the observed content. A total of 236 entries were registered with different content from the four different social media platforms (see Table 1 for an overview of the distribution of the analysed content).

Table 1: Overview of entries by country and by platform

	Facebook	Instagram	Twitter	YouTube	**Total**
Austria	21	5	15	7	**48**
Germany	24	15	16	21	**76**
Italy	11	25	4	14	**54**
Norway	27	14	11	6	**58**
Total	**83**	**59**	**46**	**48**	**236**

While the number of entries is limited, the purpose of this paper was not to provide generalising findings but rather, in line with what qualitative research does, aims to provide in-depth explanations and meanings (Carminati, 2018). One of the most prominent disadvantages of netnography is the lack of control over the sampling structure of the study population (Prior & Miller, 2012). These disadvantages could introduce some source of bias in the results regarding the representativity of the sample versus the entire population (Prior & Miller, 2012).

The value of this approach does not stem from its *statistical* generalisability to a predetermined population that has been sampled (as in representative surveying) but from its analytical generalisability to a theory of the phenomenon under study—a theory that may have much broader applicability than the specific case at hand. Instead of drawing inferences from data to an entire population, researchers using these methods compare their results to pre-existing theories and are often not focused on testing hypotheses, but rather on refining theory and generating new hypotheses.

The authors of this paper are aware of the limitations of the study when it comes to representativity issues as well as the generalisation of claims. We are aware that our results are, therefore, not necessarily representative of the whole population nor of all the content published on those social media platforms. Still, we claim that results are useful to provide empirical insights into how energy citizenship is being enacted since we can provide nuanced views of support and opposition to new energy technologies (Boudet, 2019).

Grounded Theory Methods (GTM) have inspired the analysis of data in this thesis and "consist of systematic, yet flexible guidelines for collecting and analysing qualitative data to construct theories 'grounded' in the data themselves" (Charmaz 2006, p. 2). GTM are easily combinable with the theoretical framework informing the paper and has mainly been used to represent content thematic categories.

6 Presentation and discussion of results

What do people talk about when they engage in wind energy (WE) related social media discussions? What kind of controversies are debated in the digital realm? What arguments are used in such controversies? In this section, we aim to answer these questions by providing empirical insights into the themes raised in WE-related content on the different social media platforms (Facebook, Instagram, Twitter and YouTube) across Austria, Germany, Italy, and Norway. Despite most of the content touching upon several themes at the same time, the different topics have been grouped into four main categories: nature protection, wildlife, health and recreation activities; aesthetics; energy production; and the politics of WE. In what follows, we present the different topics with examples from our empirical data.

6.1   Nature protection, wildlife, health and recreations activities

Within this category, we distinguish between three main sets of concerns: nature protection; pollution and health; and valuation of nature.

6.1.1   Nature protection: Landscapes as ecosystems and biodiversity
This subgroup comprises contents from environmentalist and nature protection standpoints denouncing the negative impacts of WE on biodiversity and ecosystems. Wind turbines are often cited as being particularly bad for wildlife (birds, bats, fish and whales, the latter two in the case of offshore wind turbines). Birds colliding and being forced to deviate from their regular routes between breeding and feeding areas are often mentioned. For instance, as one Italian user comments:

> There is really nothing to celebrate! These mega wind 'parks' do so much damage to nature (e.g., to birds in their migratory flows) and are just yet another mega profit for unscrupulous people. I am astonished that you have not looked into the matter.

> Wind farms? Harm to birds and damage to the environment

> On the migratory route of 95% of migratory birds (Instagram, Italy)

Compared to Facebook, on Instagram in Italy, greater sensitivity of users to animals emerges. In four of the posts analysed, comments were made on the fact that, in addition

to spoiling the landscape, wind turbines are often located in the migratory routes of birds and that they die when they crash into them.

6.1.2 Pollution, community health and well-being

Health concerns and pollution issues are also raised by those sharing non-supporting content on social media. Content in this category often refers to the negative effects that turbines and their low-frequency sound may have on communities' well-being and local residents' health (i.e., annoyance, sleep disturbance, psychological distress). Furthermore, the lifecycle of wind turbine materials and their potential polluting impact on surrounding environments is also questioned:

> The blades are made of fiberglass and epoxy resins (fiberglass). Their life is relatively short and disposal very impactful because they cannot be recycled. They are normally buried (Italy, Instagram).

In Norway, there are also posts on Facebook denouncing the contamination of the wind park surroundings with microplastics from damaged blades.

6.1.3 Economic and cultural valuation of nature and landscapes: Cultural heritage, recreation and tourism

Many of the people arguing for nature protection instead of WE development portray nature as a resource or setting for economic activity. For instance, one post criticises the devastating effects that a certain WE park can have on nature and local landscapes and, thus, on tourism and recreation activities. For instance, in Norway, we observed a member sharing a collage of pictures made from different pictures of the same place before and after the construction of the WE park, arguing that nature had been destroyed, leaving outdoor and recreation activities negatively affected.

Other values beyond economic ones are also evoked, such as cultural, historical and identity-related values. The landscape aspect is very important in many discussions on Facebook in Italy, especially when discussing offshore and inland WE developments in the south of Italy. Landscapes are also an important part of the local identity, meaning that their destruction would also have a negative impact on tourism and the economy.

> The sea and its skyline and the typical seascape are a resource and a wealth... natural, environmental, economic, tourist, landscape, historical and image, identity of Salento and cannot be touched! (Facebook, Italy)

In Germany, we observe content doing references to the forest inspiring one of the most famous literature works. And Austrians see their mountains as a fundamental element of their identity. In Norway, nature and landscapes are often evoked as the key to people's sense of place and identity, often idealising the human-nature relationship. For instance, the following quote from a Norwegian publication on Instagram highlights the importance of Norwegian nature as a fundamental element of the Norwegian identity and nature recreation as a cornerstone of the Norwegian lifestyle:

> The exploitation of nature is destroying the harmonious relationship between nature and humans in Norway as the following publication poses:

> The soul of the Norwegian people is built on high mountain and rough seas. And a land that gives. It gives without asking anything in return. It trusts us not to take more that we need. Not to take more than what it can keep giving. When that trust

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is broken, when the land is exploited, a piece of the soul of its people is taken away (Norway, Instagram)

The text is accompanied by a picture of mountains with windmills in the background, and a Norwegian flag at half-mast.

In much of the analysed content, WE is presented as a dichotomy of nature conservation. Many argue that energy policy paradoxically sacrifices nature in favour of a profit-driven solution, such as WE. The following tweet is an example:

Why are there so few conservationists? Isn't there money in nature? Or is it tougher to build lots of new things in nature (wind power, hydropower)? @Twitter user, @ politician @ and public authority (Norway, Twitter)

Very often nature protection arguments are raised to question the environmental friendliness of WE.

Wind turbines - they are moving ever closer to villages and line the edges of nature reserves and bird sanctuaries. The operators of the plants invoke climate protection with a clear conscience. But is wind energy really so environmentally friendly? (Facebook, Norway)

Yet, there are also negative views on environmentalists' slowing down the decarbonisation of energy systems in Italy:

Italy has never had a real energy plan, because we have the environmentalist ideology that holds back any project aimed at being more self-sufficient.

No tap, no drilling in the sea, no latest technology nuclear, no, no and no, except with wind turbines, solar panels that guarantee energy in a residual manner.

Yes, for certain eco-taliban characters we should go back to the ox-drawn cart. Except for them, of course.

Many pseudo-environmentalists I think don't even realise how much energy is needed in this country and don't even know how to produce it. (Facebook , Italy)

6.2   Aesthetics

Not all the entries examined assess wind energy parks and turbines as negatively impacting the beauty of landscapes. On the contrary, several posts share more balanced and/or strong positive aesthetic judgments, as the following examples illustrate. In an Instagram post, a Norwegian journalist shared a picture of wind turbines from the road, noting that the landscape is changing with journalistic neutrality. Also, in Italy, WE is seen as a compromise, as the least bad solution, and the negative consequences of WE park on landscapes as aftereffects to be expected.

Tastes change and the eyes get used to it, one will also get used to wind power (Facebook, Italy)

 Or comparing it with other solutions.

In the sea, hills or mountains, the landscape is always disfigured anyway. I will say that for me; however, it is always better to have a hundred wind turbines than

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thousands of square metres of photovoltaic panels covering fields and hillsides (Facebook, Italy).

In Norway, one Twitter user shared a picture taken from a plane while flying above an offshore wind park. In Italy, there are also posts sharing a positive stance concerning the aesthetics of WE turbines and parks.

> *I like wind turbines! When I go to Apulia, I stop to admire these giants.*

> *I like them. They are huge but are only moved by the wind. I dare to say that they almost relax me. (Facebook, Italy)*

6.3 Electricity production: Technical aspects of WE and energy security

The third category comprises content that deals with issues related to electricity production and the technological dimension of WE developments, such as production and prices; innovations: possibilities and barriers; technical aspects; other renewable energy (RE) sources; and energy security.

6.3.1 Production and prices

New records and other WE electricity production data are often celebrated on social media platforms, especially on Twitter. Often, the shared data comes from different countries, showing charts and other visual means to present data. In Austria, we observed several posts sharing this kind of content on Facebook as well, for example:

> *Austria is the European champion in green electricity: three-quarters of its electricity comes from renewable sources. The individual federal states make use of their scenic advantages for hydropower or wind energy. Vienna relies on solar power and creative solutions. Noise barriers, shade screens, roofs: everything that is in the sun should produce solar power (Facebook, Austria)*

In Norway, we observed several posts on Twitter informing about and celebrating new WE production records in Germany. Electricity prices are also discussed, often as a source of discontent. Several posts are critical to the increase of prices due to the interconnected EU energy market.

The cost-effectiveness of WE is also a controversial topic. Wind power is cost-effective. Land-based, utility-scale wind turbines provide one of the lowest-priced energy sources available today. Furthermore, wind energy's cost competitiveness continues. However, wind projects may not be cost-competitive in locations that are not sufficiently windy. Next-generation technology, manufacturing improvements and a better understanding of wind plant physics can help bring costs down even more.

A letter shared in a FB group questioned the transparency in consultants and analyst calculations and estimation of electricity prices. Foreign cables are also portrayed as resulting in higher electricity prices for ordinary people.

6.3.2 Innovations: Possibilities and constraints

WE innovations are seen by many with optimism as a solution to the climate crisis. Technical innovations that contribute to a more decentralised energy supply are one of the topics discussed in social media, especially in Austria and Germany. For instance, an Instagram post in Austria informs about the possibility to put a windmill on your roof.

Moreover, a YouTube video from a doctoral student presents solutions for a more decentralised energy supply. He argues that:

> *(…) when people think of decentralised energy supply, they usually think of photovoltaic systems on the roof of their own house. But that is only a small part of the possibilities. In the meantime, there are companies that build wind power plants for private households! Today I will take a look at what it looks like to have your own wind power plant on the roof, what the advantages and disadvantages are compared to photovoltaic systems and what innovative technologies are already available in this area (Germany, Youtube).*

We also see different WE businesses presenting innovations in different parts of wind turbines (motors, blades, etc.). Technical innovation when it comes to other RE is a recurrent topic in Norway. There are several videos on YouTube presenting and discussing the potential increase in production if new turbines were deployed in current hydropower infrastructures.

The broader context within which a specific WE-related innovation is going to be adopted is also an issue of concern. The lack of sufficient knowledge to implement such innovations is pointed to as one of the main barriers to the successful uptake, especially when it comes to the development of offshore WE. One of the tweets in Norway calls for better knowledge beyond technological considerations for offshore WE development.

> *I advocate slowing down the offshore wind effort. Offshore wind has external effects that we do not fully know. With a slow development, we can gain more knowledge and make better decisions about how much development we want, and possibly where we want to place it (Twitter, Norway).*

The author links to his article published in a business newspaper. In the article, the author argues that more experience-based knowledge from the evaluation of existing inland wind parks is needed. Policymaking based on lessons learned can lead to better decisions regarding different priorities, expectations, profitability, nature consequences, subsidies, etc.

6.3.3   Technical aspects

Technicalities are discussed as well, such as storage, materials, etc. One of the issues often referred to is that WE does not have stable production, since it depends on wind conditions. In Italy, we found a discussion on Twitter about technicalities, such as storage. The technological maturity and performance of WE technologies are also questioned. For instance, a technical magazine in Norway informs about the mysterious case of a wind turbine canting into the water. Several users report operation challenges under certain circumstances, such as strong wind or low temperatures, questioning the readiness of the WE technology.

6.3.4   Other Renewable Energy sources

Our data shows that people also compare WE technologies with other REs. Often, cost-effectiveness, technological maturity, production details, and impacts on nature. In a YouTube video, a woman working as an adviser in a Norwegian nature protection interest organisation discusses the advantages of hydropower versus WE. She starts by providing data on emissions calculations (from a recent report), showing the upgrading potential of current hydropower in Norway (from a 50 versus 20-30 years lifespan). She

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also discusses nature protection issues (Norwegian hydropower infrastructure is already in place and therefore has an advantage regarding nature protection) and the recycling challenges of windmills. She questions why politicians support wind energy. She points out that WE is much more profitable for businesses due to considerable tax advantages. WE is subsidised via a different tax system and green certificates, which is an extra tax on consumers to support green energy (adopted in 2011). On the contrary, hydropower has an additional tax which makes the upgrading of infrastructure unprofitable. Both the hydropower's extra tax and the green certificate are perceived as unfair. She questions the reasoning behind the politicians' widespread support of WE and claims that scientific evidence is not reflected in their decision-making. This video is also an example of the complexity and multifaceted character of WE development, a challenge that is discussed in the next category.

6.3.5 Energy security

Energy security is a topic that has recently been given a lot of attention, as a result of the war in Ukraine and its consequences on the Energy landscapes in Europe. The European energy collaboration and the dependency on Russian gas are some of the most discussed themes in our data. Interestingly, both topics raise conflicting interpretations. For instance, for many, WE is presented as the solution for becoming energy self-sufficient and avoiding the dependency on Russian gas, making further development of WE in Europe more relevant than ever. Others, on the contrary, argue that WE is making us more dependent on Russian gas since WE production is not stable and needs to be supplemented with other energy sources, such as gas.

The European energy collaboration is also a controversial topic, and many posts denounce the negative effects that energy interchanges have on consumers' prices. Others, specifically in light of the Ukraine war, believe that the collaboration increases Europe's energy security. For example, a person working in the renewable energy industry published a tweet in which he strongly disagrees with a left-party politician's negative stance towards the construction of a new electricity cable and views on the European energy collaboration.

Do you think today is a good day to rally with the European energy collaboration?

@Politician? Talking down European energy cooperation? Tell that to 40 million Ukrainians. I dare you. (Norway, Twitter)

Discussions concerning energy security topics often resurge the nuclear energy debate. For instance, several tweets in Norway share news and articles informing about those countries (Germany and Belgium) reconsidering nuclear energy. For many, in light of the Ukraine war, nuclear power is seen as the only solution to ensuring energy independence and security and reducing dependence on Russian gas. One of these articles shares the opinion of an extreme right-wing politician regarding how the Ukraine war impacts Europe's energy policy and support of nuclear power as the solution to the energy security challenges in Europe. The article portrays different views from different actors regarding nuclear power.

Moreover, the debates about whether nuclear power is one of the sources to support the decarbonisation of energy systems also raise conflicting opinions.

"nuclear cannot be the road to #Ecological Transition. Fusion will be industrialised maybe in 20 years... We must act now with mature technologies available: #photovoltaic and #wind. Backward step of #Europe on #tassonomy open to gas and nuclear" (Twitter, Italy)

6.4 The politics of WE: governance, justice, and barriers

The last category includes content that discusses the political dimension of the implementation of the transition, in particular of WE development. Thus, issues of power, agency, inequality and participation are brought to the forefront of the debate, highlighting the dynamic, complex and multi-layered interplay between WE development and democracy. The relevant content observed in our study is divided into three different subcategories, namely, governing WE developments, where governance aspects, energy justice issues and barriers to the uptake of WE are discussed.

6.4.1 Governing WE developments: spatial levels, location, policymaking and malfunctioning aspects

The implementation of WE technologies is a complex endeavour affecting different levels. For instance, two main spatial levels, the local and the global are evoked in the observed narratives on WE on social media. Our data shows that those discussing WE in a local (including regional) context tend to attract more negative stances than those doing it in a global context. For instance, those engaging with the implementation of WE at a local level often claim negative effects on landscapes and wildlife, as well as on local communities close to WE parks. Those supporting WE often focus more on the overall gains in terms of global reduction of CO2 emissions.

Different levels are also discussed when dealing with the governance of WE implementation. For instance, when it comes to responsibility for regulating granting licences and the construction of wind parks. In Austria, for example, the current division of responsibilities for granting licences and construction of WE parks between federal and state levels does raise opposition. While the right-wing party wants to leave responsibility at the state level (decentralised), the current government wants to give responsibility to the federal ministry (centralised) as the following Facebook post shows:

> *The Green Minister #Gewessler wants to take away the competence for the erection of wind turbines from the states in order to force #wind turbines in all states - among others in Carinthia.* 🟦

> *We [...] will not allow the ÖVP-Green #Federal Government in Vienna to destroy our beautiful province, the untouched Carinthian natural and mountain world and Carinthian tourism!!* (Facebook, Austria)

Location is the key issue to understanding the lack of support for WE development in all countries. In Norway, NIMBY arguments are often raised in local groups against local WE plans. This type of opposition is well organised by means of social media, especially on Facebook. Members of these groups are often residents and share different types of content, such as a newspaper article about the development of new plans in one municipality, or an article from the national public broadcasting information service describing a local demonstration against WE plans. Another member shared maps of the affected areas in the discussed projects. Furthermore, WE parks may have

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consequences that go beyond the national borders. Such is the case of an offshore WE park in Sweden, close to the Norwegian border.

In the case of Italy, the location of WE parks is also an important issue for the opposition. Furthermore, the traditional North-South divide is also brought up in the debate about the construction of WE parks, especially on Instagram and Facebook. The South feels exploited by the rest of Italy. Several posts on Facebook in Norway come from members of groups against WE. In these groups, concerns about licence-granting processes are a frequent topic. Many argue that there is a lack of sufficient knowledge base to support decision-making, as well as other shortcomings of such processes. For instance, one of the articles shared in one of these groups concerns the dubious role of experts and authorities in processes in which licences are granted despite negative assessments from experts. Local governments seem to be easy targets for foreign investors.

6.4.2 Energy justice and democracy: Human rights, uneven costs and benefits and hidden agendas

Concerns about respect for human rights and the functioning of democracy are most widespread in Norway and Italy. For instance, a letter shared in a Facebook group against WE refers to a case that has received a great deal of attention in Norway. The letter denounces human rights violations towards indigenous people in Norway during the development of a WE park. The park was erected in an area used by indigenous Sami, whose reindeer herds were spooked by the noise, thus impacting the livelihood of the indigenous Sami. The case was sent to the Supreme Court, and despite the Sami winning the case, the court's decision did not stop its construction or operation since the economic benefits for the company operating the wind farm are higher than the fines. Other members of the Facebook group against WE shared an opinion piece from a local newspaper demanding the dismantling of the wind park as a human rights/democratic issue.

Transgenerational responsibility is also discussed and used as an argument for both supporting and opposing WE developments. According to those in favour, supporting WE can contribute to decarbonising energy systems, reducing global CO2 emissions and contributing to future generations' financial situation, as the following quote illustrates:

> *We are investing in a wind and solar park. We join in. For the return. Financial. But especially for his children and grandchildren (Twitter, Germany)*

However, for others, as one of the Norwegian YouTube videos argues, WE developments in the present will compromise future generations' rights since they will inherit a country in which nature has been destroyed for the economic benefit of foreign capitalists. Furthermore, citizens living close to wind farms believe they will not benefit from WE. There is a feeling of mistrust towards the political class, which is perceived as corrupted, incompetent and disinterested, not caring about citizens:

> *How many wind turbines are 'planted and placed' in our territory to save money where and when? Have we noticed a difference in our bills? But what sustainability? This is just another opportunity for those behind them to eat money!!! They only ruin the landscape...people still believe those who govern and that all the things they do, they do them for our good and the future...yeah right!*

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Whatever plant will be made, installed, built and perhaps put into operation, it will certainly not be for the benefit of the people but of the mafias and multinationals, and the cost of such plants will be poured into the bills of Italians. It already happened around 2005 when the wind farms, and photovoltaic and miniature photovoltaic plants on roofs came into being and, in order to pay for the plants, they put a quota under 'other charges' (Facebook, Italy).

The uneven distribution of cost and benefits is also a common topic in the other countries, as the following quote from Italy shows:

They are right to oppose it! We in the Matese mountains are saturated but there is no economic return! Only for the companies! The price of energy has risen disproportionately anyway! (Instagram, Italy)

6.4.3 Barriers to the uptake of WE

One of the barriers identified in our data is the lack of suitable political and administrative frameworks.

"The citizens want #Windenergie ! It would be your job to provide the political and administrative framework for such projects to be implemented quickly." (Germany, Twitter)

Two main types of stakeholders are accused of slowing down the uptake of WE technologies, namely, nature conservationists and politicians. These kinds of claims are often coming from supporters of WE that see these stakeholders as a barrier to the rapid uptake of energy technologies.

The real energy transition will take place when people realise that - environmental organisations and associations -are the unpresentable environmentalists who don't give a damn about the environment (Instagram, Italy).

The role of politicians is a common topic discussed in WE-related content on social media in all countries. Politicians are often accused of being a barrier to the development of WE plans, often due to a lack of long-term perspectives and focus on re-election. This is a prevalent attitude on Twitter, both in Germany and Austria. These ask politicians directly to provide better frameworks for the uptake of WE.

At the #Sicily Region to the unanimity against #offshore wind. #read the reasons (archaeology, seabed, fishing...) Worse than #nimby there is only the #nimto (not in my terms of office) of politicians" (Twitter, Italy).

The people in the country are much more advanced than many politicians of #Union and #FDP would like to believe (Twitter, Germany).

When it comes to the role of the citizens, in Germany we observed efforts to counteract the widespread narratives that portray rural areas as WE opponents. Several tweets highlight public support for WE. Data and statistics of voting polls for WE were also provided.

Actually, in Germany, we observe a great deal of posts arguing for "Another good news from NRW: In Roetgen voted 70% of the people FOR windenergy-transitions in their hometown. And again it demonstrate that the "rural people are against WE" argument is a fairy-tale (Twitter, Germany)

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In the same vein, the green party in Germany is using its tweets as a mobilising information source for citizens to support WE.

Paradoxically, politicians are also criticized for supporting WE developments with negative consequences for the local community. Often, politicians are accused of corruption and/or having a hidden agenda, as discussed above. Much of the content in Italy expresses the feeling of their land being exploited and destroyed by politicians who do not pursue citizens' interests at local or national government levels.

> *According to you, we should now rejoice if a gang of delinquents legalised by the state come to install a load of wind turbines in front of one of the most beautiful gulfs in Italy! (Instagram, Italy)*

Especially in Italy, there are many complaints about bureaucracy being the main barrier to development. The negative perception towards wind farms is related to the distrust of institutions and the idea that corruption and the mafia are behind large renewable energy projects. Basically, many believe that wind farms are useless, that they are built only for the interests of a few, and at the same time argue that the complex bureaucracy in Italy prevents the development of renewable energies.

7 Concluding remarks

Drawing on the results from a netnographic study, the paper has approached energy citizenship enactments by looking at different WE-related engaging themes in four social media platforms (Facebook, Instagram, Twitter and YouTube) in four countries (Norway, Austria, Germany and Italy). Results point to four main themes being discussed in social media: nature protection, wildlife, health, and recreation activities; aesthetics; energy production; and the politics of WE.

Nature conservation, wildlife protection and recreation activities are often raised by those opposing WE developments. In this category, the content often portrays WE as having devastating effects on ecosystems and habitats of animals, as well as on the beauty, diversity, singularity and recreational value of nature and landscape. This is the most frequent topic discussed on Facebook and Instagram, both in Norway and Italy. Within this category, we distinguished between three main concerns: nature protection; pollution and health; and valuation of nature. Finally, the great majority of the content analysed that belongs to this category comes from opponents of WE. However, in Austria and Germany, we observe content counteracting such concerns with evidence-based information. We observe several tweets, often referring to other sources (scientific studies, newspaper articles, other tweets) questioning the negative impacts of wind turbines' infrasound on citizens nearby. In Austria, we found a Youtube video addressing WE myths by providing scientific evidence that questions health-related claims and hyped negative consequences on wildlife.

Another theme often discussed is the aesthetics of WE. Not all the content examined considers wind energy parks and turbines as having a negative impact on the beauty of landscapes. On the contrary, several posts share more balanced and/ or strong positive aesthetic judgments. This is the least discussed theme among the ones identified. The third category comprises content that deals with issues related to electricity production and the technological dimension of WE developments, such as production and prices;

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innovations: possibilities and barriers; technical aspects; other renewable energy (RE) sources; and energy security. Discussions about these topics are more common on Twitter and YouTube, and very often they come from technological optimism users. Finally, the last category group concerns the political dimension of implementing the transitions, particularly WE development. Thus, tensions and issues of power, agency, inequality, and participation are discussed. This category highlights the dynamic, complex and multi-layered interplay between WE development and democracy. The relevant content observed in our study is divided into three different subcategories, namely governing WE developments, where governance aspects, energy justice issues and barriers to the uptake of WE are discussed.

Our results show that WE raise multifaceted and complex debates in social media. The debate is contentious and goes beyond technological matters. Contextual norms, spatial narratives across different energy geographies, diverse path-dependent trajectories, and other complementary or competing technologies shape people's engagement with the energy transition. Indeed, aspects from the physical, political and social landscape; factors such as noise regulation and aesthetics; and political bargaining are some of the most common topics raised in the social media debates, and can significantly influence project developments.

Our results also illustrate the explanatory limitations of the normative conceptualisations of energy citizenship. Public participation and engagement in transitions in practice are far from just support, as some of the normative conceptualisations of the term energy citizenship suggest. Instead, our findings point to energy transitions as a contested realm, and engagement and participation as involving a variety of standpoints and practices, from uncritical support to resistance and opposition.

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