The Regional Case for Disruptive Energy Policy: A Civic Energy Perspective

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Abstract

Background

This paper deploys a regional actor perspective to detect policy enablers of and barriers to the uptake of civic energy. In common with other forms of regional, decentralized energy, the civic energy concept not only challenges historical energy business models but changes the energy agenda to prioritize community development and climate issues. Energy policy needs to react by shifting from purely market regulations to the promotion of shared community energy solutions. Both current energy structures and established policy priorities are unsuited to deliver on widely recognized energy transition and sustainable development goals. Switching from a centralized to a decentralized energy mode is viewed as a major re-structuring of a socio-technical regime. In a series of expert interviews, two disruptive policy approaches, creative destruction and experimentation, are analyzed as to whether they can contribute to overcoming path dependency and carbon lock-in.

Results

The interviews conducted with local and regional energy facilitators in seven North European countries identified a range of active, predominantly municipal and regional policy enablers of civic energy. Motivation for specific civic energy initiatives was derived from the translation of global climate goals such as the Paris Agreement into more focused and therefore tangible local targets, which acted as direct policy enablers. At the same time critical inconsistencies and a lack of coherence were identified in several national and European energy policy mixes. Over and above dismantling existing administrative and legislative restrictions on civic energy uptake, experimentation is needed to develop new community partnerships that can host civic energy initiatives and mobilize untapped local energy resources.

Conclusions

Mastering the uncertainties of re-framing energy systems requires systematic experimentation and an extended mandate for local and regional authorities. Whereas the fossil versus renewable energy policy debate seems to have been won, the shift from centralized to decentralized systems threatens existing power structures and remains highly contentious.

Background

Civic energy (CE) can be characterized as an economic and operational concept that foresees participation and/or ownership by citizens or members of a defined community in local/regional renewable energy generation, distribution and/or deployment. The term is therefore largely synonymous with “community energy” as used by IRENA [1] but explicitly emphasises the inclusion of both formal communities (municipalities) and less formal communities of citizens, thereby adopting the compound concept of the civic energy sector presented by Hall et al. [2], which helps avoid unnecessary demarcation disputes among promoters of a decentralized, renewables-based energy system. Such a system change is classified in the literature as energy transition, “the switch from an economic system dependent on one or a series of energy sources and technologies to another” [3]. In his review of past energy transitions Grubler concludes that the need for the next energy transition is widely apparent due to the unsustainable nature of current energy systems in terms of social, economic and environmental criteria [4]. Other authors emphasize specific motivational factors ranging from the costly inefficiencies of conventional, long-distance power structures [5] to the striving for autonomy on the part of prosumers from centralized utilities that dominate the energy market [6]. However, the key current transition driver is clearly the potential contribution of the energy system to decarbonizing the economy [3] and piloting a post-fossil era [7].

For the purposes of this paper the broad definition of civic energy put forward by the European Economic and Social Committee (EESC) is adopted, namely “decentralized renewable energy generation owned (at least 50%) or operated by citizens, local initiatives, communities, local authorities, charities, non-governmental organizations (NGOs), farmers, cooperatives, or small and medium-sized enterprises (SMEs), creating a stream of local value that can stay within the region” [8]. The EESC definition reiterates the concept of regional energy brought forward by Scheer [9]. Due to its reliance on decentralized energy and distributed, home-grown energy resources civic energy is a conflict-ridden concept. It challenges the top-down control logic of traditional power supply and the business models of the incumbents and thereby conflicts with strong, interwoven, economic, institutional and political interests [10]. For such a transition to succeed, the current oligopolistic energy structures need to be addressed and partly replaced [11, 12], which in turn requires a supportive legal and policy context [10, 13]. Schleicher-Tappeser [10] predicts a turbulent transition and stresses that its speed and smoothness will strongly depend on the evolution of appropriate regulatory frameworks. The urgency of dismantling clearly observable regulatory barriers [14] to the adoption of low carbon business models has been recognized at least at a European strategy level [15].

In the policy field there is no shortage of resolutions and goal setting. In its long-term 2050 vision (of 2018) the European Commission asserts that the clean energy transition has already “spurred the modernization of the European economy, driven sustainable economic growth and brought strong societal and environmental benefits for European citizens” and that the targeted transition will be reached via a largely decentralized power system based on renewables [16].

The recent more operative Electricity Market Directive [17], whilst acknowledging in its preamble that the move from highly centralised towards decentralised electricity production from renewable energy sources (RES) requires adapting the current rules of electricity trading and changing the existing market roles (recital 6), fails to deliver a decentralization pathway. Similarly, whilst recognising the efficiency potential of distributed community energy together with the delivery of social, economic and environmental benefits to the community (recital 43) the new citizen energy communities are treated as consumer groups (and therefore market players) created through an upscaling of individual interests and not primarily community initiatives [18, 19]. This interpretation is reinforced by the exclusion of formal communities (municipalities) and their established track record in pioneering community energy [20–22] in the distribution of electricity market roles. Neither does the Directive provide any binding stipulations for distribution system operators (DSOs) to provide grid

access to distributed energy providers, a bottleneck encountered by many civic energy initiatives, but leaves the provision of the necessary regulatory framework to the discretion of the Member States.

Far from creating a level playing field between centralized and decentralized energy as targeted by the Commission (recital 43), the new market design leaves existing power structures largely intact. Hewitt et al. [13] conclude that the only recognizable change initiated by governments to meet the goals of the Paris Agreement is the large-scale deployment of renewable energy systems under centralized business models and market conditions attuned to the multinational energy incumbents.

Confronted with such and similar hesitant policy responses to the demands for re-aligning energy systems, which Geels et al. [23] have classified as “reformist”, a growing number of energy transition scholars have embraced alternative, disruptive policy approaches in order to overcome path dependency implying carbon lock-in, i.e. the organisational inability or unwillingness to re-design energy systems. Two such disruptive approaches will be considered here: creative destruction and experimentation.

Creative destruction

Mathews was among the first scholars to apply the Schumpeterian business cycle concept of creative destruction [24] to overcoming the carbon lock-in tolerated by classical economics and its political representation [25]. Mathews’ analysis of techno-economic paradigms (TEP) is reminiscent of Kuhn’s view of paradigms in science as “universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners” [26] but is explicitly based on Kondratiev’s wave theory and the concept of techno-economic paradigm shifts as expounded by Freeman and Perez [27]. The carbon lock-in is viewed as a central feature of the oil-based fourth TEP, which even in investment terms ended around 1980. Mathews argues that the emergent sixth TEP based on decentralized renewables (but also on resource circulation and eco-targeted finance) is already yielding superior performance and profits. Mathews concludes that, to accelerate the rate of uptake, policy needs to dismantle the institutional supports of the incumbent regime. Creative destruction has since been adopted as an instrument of energy transition pathways analysis with the aim of destabilizing outdated energy regimes [28].

In their analysis of policy mixes for sustainability transitions Kivimaa and Kern [28] present an analytical framework that outlines the “motors of creative destruction” In their view this needs to include both creative (C) and destructive (D) elements, the latter comprising control policies (D1), significant changes in regime rules (D2), reduced support for dominant regime technologies (D3) and changes in social networks and replacement of key actors (D4). Within this framework the removal of fossil fuel subsidies in order to establish a level playing field between old and innovative economic models are regarded as destructive (D3), although motivated by creative objectives. However, the use of destructive policies to initiate policy replacement [29] proves to be rare due to the close relationships between government and incumbent regime actors [30]. An exceptional case of destabilization policy in enabling low-carbon energy transitions is to be found in the German nuclear phase-out policy of 2002 (and reinforced in 2011 following the Fukushima incident), which contributed more to the uptake of renewable energies than any other policy instrument [31]. This assessment, however, fails to compensate for the lack of coherence and the abundance of inconsistencies in the so-called *Energiewende* [32] and needs to be balanced by the consistency of the countermeasures enforced over the past 10 years that have in effect reinforced the system lock-in. Diercks et al. [33] call for caution in projecting destructive policies as any paradigm shift is characterised by a messy political process and is confronted with the strong legacy of an economic, firm-centred and technology-oriented tradition in innovation policy. Switching from a centralized to a decentralized energy mode is to be seen only marginally as a technological change and more as a major re-structuring of a socio-technical regime.

Experimentation

An alternative but potentially equally disruptive route to enabling legislation to keep pace with innovation [34] or equipping governance processes to address so-called wicked environmental and social problems [35] is presented by the experimentation policy option inclusive of experimental legislation. In broad terms experiments are regarded as a means through which policies diffuse, as symptomatic of changing structures of political authority and opportunity, as a means for effecting socio-technical transitions [36]. In particular, experimentation especially at sub-national level is claimed to be better suited to addressing the complex nature of climate governance than national and transnational instruments [37, 38]. Heldeweg [38] distinguishes between two broad categories of legal frameworks for experimentation: exceptional derogation from existing legal rules in the hope of experimental findings that can be used to adjust legal arrangements and devolution that allows for different approaches to address a policy challenge. Experimental legislation mostly involves “new temporary regulations with a circumscribed scope that, derogating from existing law or waving the observance of a number of rules or standards, are designed to try out novel legal approaches or to regulate new products or services” [39]. These temporary, small-scale rules are, in turn, evaluated after a specified lapse of time, and depending on the results, the legal framework is adjusted in the light of the findings [40, 41]. The advantages of such an approach are threefold:

- Clarification of transition uncertainties in particular through testing in (ideally representative) geographical and societal settings prior to new legal stipulations [42]
- Fewer supply and value chain risks due to the establishment of new proven processes [43]
- Less effective resistance from vested interests lobbying to protect historical business models [44, 45].

Experimentation as a means of overcoming damaging path dependency can draw on the tradition of pragmatist experimental political inquiry as developed by Dewey, who viewed any policy put into practice as an experiment. Dewey’s approach involves framing or re-framing publics and problems, weighing ends and means, acting and evaluating any action taken [46]. One indication that such a policy development strategy is perceived as politically more palatable than explicit destabilization policies is to be found in the formalization of political and legal experimentation processes in Finland and the Netherlands [37]. In their analysis of climate governance experiments Laakso et al. [35] view “the experimental turn” as a step towards evidence-based governance and legislation. The recent justification for regulatory sandboxes provided by the European Parliament’s policy department is relevant to handling the energy transitions

challenge: “In the face of the rapidly changing environment and given the limitations of traditional law making, jurisdictions have resorted to innovative regulatory approaches to respond to the innovative disruptions” [41]. However, and perhaps indicatively, this undertaking relates to financial-technical innovations across the EU.

The above advances extend the repertoire of available policy options to address the multi-layered and multiple sector challenges of decentralizing and decarbonizing energy structures. The complexity of these challenges is characteristic of all sustainability transitions: supportive policies in one sector are often offset by unsupportive policies in other sectors [47]. In an attempt to outline what policy enablers are needed to boost the uptake of civic energy and in anticipation of their disruptive elements three key questions will be addressed in the following:

1. Which if any current policies support energy transition through the promotion of civic energy?
2. Or do current policy frameworks erect insurmountable barriers to the uptake of civic energy and therefore merit dismantling?
3. In view of the uncertainties of energy transition processes and their outcomes does experimentation offer a pragmatic alternative to testing novel civic energy solutions?

In order to avoid the counter effects of lacking cross-sectoral policy coherence these questions are treated from an actor perspective provided by a target group of civic energy project initiators and facilitators spread over seven Northern European countries. The approach is based on the stakeholder model for policy evaluation [48] and comprises a series of expert interviews with civic energy representatives directly confronted with a range of both policy barriers and enablers.

The rest of this paper is structured as follows: the Methods section outlines the methodology deployed in conducting the focused interviews; the Results section presents the empirical findings of the stakeholder assessments grouped according to the topics addressed; topics for discussion arising from the findings are then presented in the Discussion section; finally, implications for civic energy policy and policy innovations needed to overcome the stalemate produced by entrenched energy path dependency are presented in the Conclusions section

Methods

The actor perspective was provided by semi-structured expert interviews conducted along the guidelines provided by Meuser and Nagel [49], whereby experts are defined not as assessors but as participants in a specific field of action with responsibility for problem-solving within that field. An interview guide was designed to generate both process and contextual knowledge but, at the same time, to allow the interviewees as much scope as possible to express their views. Documentation was provided via transcripts offered to the interviewees for editing prior to compiling a topic-related synopsis. The initial interviews averaged 90 minutes in length and were extended via the editing process.

The interview partners were selected not only due to their experience in prioritizing civic energy within their own organizations but also due to their familiarity with a collaboratively developed civic energy process design [43], which enabled them to assess the role of policy enablers up against other decisive process elements and enablers.

The guide was structured to capture existing policy support provided for civic energy initiatives and the relevant policy level together with encountered policy barriers. An attempt was also undertaken to apprehend both motivational factors and cultural traditions as these were considered highly influential in determining levels of satisfaction or dissatisfaction with existing policy frameworks and the interviewees’ optimization proposals. The contributions of the interviewees are supplemented by relevant insights from the energy transitions literature in the Discussion section.

The initiatives represented by the selected facilitator experts cover a wide range of civic energy sectors including solar cooperatives, comprehensive village energy solutions, B2B (business-to-business) and B2C (business-to-consumer) district heating infrastructure deploying waste heat, replacement of fossil energy by renewables in a farming community, shared energy infrastructure for new urban developments and community-driven local energy planning. The common denominator of these highly diverse activities is that they are all embedded in community-led energy initiatives. Table 1 provides an overview of the interviews conducted between 01.12.2020 and 06.01.2021:

Table 1: Overview of conducted interviews

<i>No.</i>	<i>Interviewee responsibility</i>	<i>Organization type</i>	<i>Country</i>	<i>Date</i>
1.	Senior Advisor Agriculture	County Governor	Norway	01.12.2020
2.	Climate and Energy Advisor	County Council	Norway	02.12.2020
3.	External project manager	Municipality	The Netherlands	03.12.2020
4.	Project manager	Local energy consortium	Scotland	08.12.2020
5.	Policy Officer	Profit for purpose organization	UK	08.12.2020
6.	Renewable Energy Policy Advisor	Province	Belgium	15.12.2020
7.	Energy Secretariat	Municipality	Denmark	10.12.2020
8.	Circular Economy	Municipality	Denmark	14.12.2020
9.	Energy Policy Coordinator	Municipality	Sweden	16.12.2020
10.	External Development	Municipality	Denmark	17.12.2020
11.	Climate Officer	District authority	Germany	17.12.2020
12.	Commercial Director	Environmental services company	Belgium	06.01.2021

Due to the limited number of interviewees no claim for comprehensiveness can be made. However, the scope of the featured initiatives and the range of encountered policies may well serve the interests of an indicative evaluation.

Results

The results of the interviews, presented below, are grouped to address the topics of (i) civic energy motivation, (ii) cultural traditions supporting CE, (iii) identified active policy enablers of CE, (iv) the impact of national policies and (v) EU policy frameworks on CE. Proposals for additional policy enablers and for the removal of encountered barriers are presented in section (vi), which is followed by a discussion of future roles for local and regional authorities (LRAs) in the energy market (vii) and an assessment of the potential of experimentation as a policy option (viii).

(i) Civic energy motivation

Climate protection through efforts to re-design energy structures was identified as a common motivational force in all interviews. Motivation for specific civic energy initiatives was derived from the translation of global climate goals such as the Paris Agreement into more focused and therefore tangible local targets, which acted as direct policy enablers. In the featured Swedish municipality this translation exercise was completed within 4 months; the ensuing energy transition programme shortlists climate issues as community development projects. In other areas individual projects were closely linked to climate-related objectives such as social acceptance of energy transition processes through the delivery of energy system benefits to local citizens (interviews 3 and 6), the striving for energy self-sufficiency (interview 7), the mobilization of green growth potential (interviews 8, 9), the vision of fossil-free farming (interviews 1, 2) and the replacement of technically and financially inefficient centralized energy structures - that impede the 2050 climate objectives - by efficient decentralized systems based on shared community energy solutions (interview 12). Implementation of a shared solutions model led to the establishment of varied interests entities to allow customers to become shareholders in renewable energy projects.

(ii) Cultural traditions supporting CE

In order to understand national policy frameworks, let alone attempt their re-orientation, it is necessary to consider their cultural determinants expressed in traditions [50]. In three out of seven target areas no traditions of long standing that could support the uptake of civic energy are evident. In strong contrast to the three Scandinavian countries Belgium, the Netherlands and the UK with its traditional reliance on market solutions lack any such community tradition and the German concept of state responsibility for the provision of essential public services (Daseinsvorsorge) has been under severe attack by neo-liberal forces since the early 1990s.

Norway still exhibits a cultural tradition that views natural resources including energy resources not as commodities but as public goods and maintains strong scepticism towards both foreign and private ownership of the country's resources (interview 2). Ringkøbing-Skjern's striving for energy self-sufficiency is the product of a rural Jutland community and an inherited mentality of working together to survive. This mentality makes it possible to group different walks of life to benefit the community as a whole. However, the approach is not directly transferrable to urban settings (interview 6). Despite the national policy swing of 2004 towards privatized energy, which led to DONG acquiring almost all Danish power plants, civic energy never died and is reflected in the 20% shared local ownership principle, which has recently been extended to apply to not only wind energy but all renewables installations (interview 8). In Sweden there is a strong active community tradition which results in people being used to running things collectively. This fosters network building and a pooling of resources and expresses itself in diverse areas, from district heating to childcare (interview 9). Efforts to build a civic energy culture and promote the delivery of community benefits as a non-mandatory requirement for renewable energy subsidies are underway in Flanders (interview 6) with energy communities playing a central role. Here corporate-community partnerships are seen as powerful win-win models that benefit citizen shareholders and create a new political force for policy renewal (interview 12). In the UK devolution has contributed to the boom in civic energy initiated by the introduction of feed-in tariffs in 2010: Scotland now has its own local energy policy endorsed by Scottish Government and Local Energy Scotland maintains an online map register of local energy initiatives highlighting the flow of community benefits and the elements of shared ownership integrated into the local energy projects [51]. The

situation in Germany is highly ambivalent: On the one hand, a lot has been achieved in the field of renewable energies; on the other hand, the concept of civic energy is contrasts sharply with the embedded centralization of energy systems and services that has replaced the Stadtwerke tradition over the last ten years. (interview 11).

(iii) Active policy enablers of civic energy

Direct policy enablers that provided mandates for formal communities to engage citizen groups in civic energy projects were found to be in place in all of the seven focus countries, whereby in two cases, co-ownership stipulations in The Netherlands and community-led energy plans in Scotland, these were policies under development at the start of the initiatives.

The survey revealed a clear dominance of municipal policy enablers. A reinforcement of municipal civic energy policies through alignment with either regional or, to a lesser extent, national policy was detected in the majority of target areas. As examples of the latter, in Norway a regional development plan highlighting climate policy was adopted by 18 municipalities and supported in the agricultural sector by a regionalized national policy of the Ministry of Agriculture to upscale renewable energy (interviews 1 and 2). In Germany the National Climate Initiative of 2007 gave rise to municipal climate action plans that addressed all sectors, whereby this type of joint effort was viewed as somewhat inconceivable today (interview 11). Municipal-regional policy alignment, on the other hand, is evident in The Netherlands in the emerging Drenthe Regional Energy Plan [52]. Denmark already boasts a range of regional-municipal cooperation platforms on municipal energy and climate planning, e.g. DK2020 [53], allowing, for example, the Central Denmark Region to facilitate and coordinate 19 municipal strategic energy plans to date. A support framework for local energy systems has also been initiated by Scotland as a devolved region [54]. Figure 1 summarizes the distribution of policy levels at which CE policy enablers were identified by the interviewees.

Two explanations were offered for the high relevance of municipal energy planning: a) the fragmented sector and subsector administration common to national environmental legislation was found to be unsuited to tackling climate issues and b) climate goals could not be reached without enrolling communities (interviews 7, 9, 11). This policy shift towards community-driven climate and energy strategies provides an extended policy backdrop for CE and replaces the traditional sole focus on energy market issues.

(iv) Impact of current national policies on CE

Certain national policies such as the comprehensive Swedish Green Growth strategy, the high Danish national climate targets and Scotland’s devolved local energy policy allow for local transposition and the enrolment of local actors in energy transition projects. However, the barriers encountered elsewhere by CE initiators are diverse, some of which were viewed as critical. In line with Kivimaa’s differentiation between creative and destructive change elements [28] current national policies were approached from two perspectives: restrictions on CE in need of removal and additionally needed policy innovations to promote CE (section v). The former, table 2, addresses entrenched policies impeding CE advancement:

Table 2: Restrictions on civic energy imposed by national policies

<i>Policy focus</i>	<i>Restriction</i>	<i>Jurisdiction</i>
Municipalities	Some severe restrictions on the market involvement of municipalities were encountered in Osnabrück: a number of district heating initiatives could not be implemented because the municipalities are legally not permitted to run energy operations and no other public interest representative could be found. The Upper Administrative Court of Lower Saxony has in its extreme interpretation of the subsidiarity principle ruled that if a public service can be delivered by a private contractor, then a local authority is not entitled to deliver it (interview 11).	Germany
	The advisory services of LRAs are currently restricted by State Aid rules; the notion of competitive advantage was perceived as misplaced in the pursuit of public climate objectives (interview 2).	Norway
	Although municipalities play a highly active role in energy transitions certain restrictions in implementing overdue measures are still in force, e.g. solar installations on roofs of public buildings. Also due to competition laws they are not allowed to install charging stations for electric vehicles but the charging infrastructure is inadequate and the market has failed to deliver (interview 7).	Denmark
Bureaucracy	A one-stop shop for permits and financial support mechanisms, e.g. for solar energy on farms, would increase administrative efficiency and policy implementation (interview 2).	Norway
	The Dutch Climate Agreement of 2019 [55] contains ambitious objectives but its major flaw is that it was designed for developers not for communities. For communities of citizens to become involved they need to be qualified or equipped to negotiate with developers. This entails intensive capacity building, which as yet is not foreseen (interview 3).	The Netherlands
	The new Renewable Energy Act has become so complicated that only experts can interpret it. This has the effect of keeping civic energy to niche settings and partly explains the recent decline in the number of new energy cooperatives (interview 11).	Germany
Financial viability	The restrictions on the level of individual financial involvement in civic energy need to be lifted if economies of scale are to be generated (interview 3).	The Netherlands
	Energy cooperatives cannot currently be formed in the farming community due to stipulations of the national electricity law. By allowing for cooperative market participation cost advantages could be generated through economies of scale not provided by individual energy ownership regulations. (interview 1).	Norway
Grid network	Most restrictions facing civic energy relate to grid constraint and congestion. Also, the management of the centralized system does not foresee a role for CE groups in grid network planning. (interview 5).	Scotland and UK
	The grid system, in particular the way DSOs conduct their operations, is a left-over from the old, one-directional, centralized energy system. DSOs exercise a bottleneck function: they show little interest in community welfare as they are a national actor committed in large to economic efficiency and not their local sustainable impact (interview 9).	Sweden
	Up until now DSOs have not been compelled to contribute to the 2050 climate goals and their business models fail to support shared energy solutions (interview 12).	Flanders

(v) EU policy framework and its limitations

A number of the issues addressed in section (iv) is influenced by European energy policy[1]. The current dominance of multi-national utility interests in the energy market can be traced to the EU energy market reform of 2004 and in particular to its guiding principles of “liberalization” and “unbundling” [56, 57], whose application served to dismantle municipal energy structures and replace these by a very limited number of private monopolies or oligarchies. As cited in the Introduction, the Electricity Market Directive together with the Renewable Energy Directive of 2018 [16] purport to compensate for this development by recognizing consumers as belonging to the group of market players. This concession is effected by the legalization of Citizen Energy Communities CECs (Electricity Market Directive) and Renewable Energy Communities RECs (Renewable Energy Directive). Both their formats and scope, however, are limited, with all decisive stipulations that potentially address the issues of section (iv) left to the discretion of the Member States and the national transposition processes.

The interviewees detected no impact as yet from national transposition of the Electricity Market Directive with legislation in Belgium, the Netherlands, Sweden and Denmark merely offering literal translations of the Commission document and Germany with no draft legislation in sight prior to the elapse of the transposition deadline. The terminology of the Danish legislation does, however, underline social and community benefits in the recognition of CECs and RECs. In the absence of additional legislation and support mechanisms little impact on energy communities was expected from the Dutch transposition of the Market Directive (interview 3). National transpositions to date have also failed to make use of the option included in Article 16 to “grant citizen energy communities the right to manage distribution networks in their area of operation” [17] Established monopoly structures including DSO operations and administrations remain unchallenged, so that the policy barriers to civic energy remain in place (interview 12).

The unbundling stipulations of the previous market regulation, the Third Energy Market package [58] have been maintained as a leitmotif in the current market policy: in the distribution of market roles outlined in the Electricity Market Directive no explicit role is granted to municipalities or LRAs. This was considered a serious deficit by all interview partners and prompted the question as to which future roles LRAs should play in a future decentralized, renewables-based energy economy, see section (vii).

(vi) Proposals for CE policy enablers

The extent of the encountered but unevenly distributed obstacles to the uptake of civic energy illustrates that no single policy intervention such as tax exemptions for cooperatives, although helpful, would create the needed level playing field between decentralized and centralized energy, since the latter is protected by entrenched legislation in a complex range of policy areas, both at European and more decidedly at national levels. Although dismantling barriers was considered a priority, the interviewees provided a selection of strategic proposals for new effective CE policy enablers:

1. The transition to 100% renewable energy could be greatly enhanced by making municipal climate and energy plans, so-called SECAPs [59], mandatory, thereby replacing their current voluntary status. Such a provision would entail close monitoring and the resources needed (interview 2).
2. The above provision should be seen as an extension of municipalities' remit for energy. In order to avoid targeted energy transition values being treated as limit values, municipalities need to be invited within a national dialogue to set their own, possibly higher targets, which could differ across a particular country (interview 7).
3. Municipalities ought to be allowed to deliver services of general, public interest, since public interest often conflicts with corporate interests and only the municipalities are able to mobilize the deployment of regionally resourced renewable energy (interview 10). In Germany compensating for the current handicap would demand a uniform municipal commercial law, which is currently fragmented.
4. Ideally a mandatory inclusion of community benefits and/or shared ownership in permitting procedures would boost civic energy uptake (interviews 4, 5 and 6) Linking the level of RES subsidies/certificates to the level of negotiated community benefits would help promote the civic component of renewables and at the same time link urban planning to regional spatial planning. This is not currently feasible as permits are issued solely on the basis of environmental criteria (interview 6)
5. New models of local ownership and participation in decision-making on the use of energy profits are decisive for the success of community energy. Commercial incentives for local engagement still need to be developed (interview 3).
6. Climate partnerships need to be hosted by the business community and not just the energy incumbents. In Denmark 13 such climate partnerships were set up in 2019 and their achievements are monitored by the Green Business Forum [60], (interview 8). Appropriate corporate-community models have also been developed outside the Danish business culture but are currently obstructed by embedded monopoly structures that are by no means restricted to utilities but extend across the entire supply chain (interview 12).
7. A new design of DSO functions is overdue. This needs to address not only local RES-based generation and grid input but also local supply and demand balancing (interview 4). DSOs need to be forced to redefine their goals. They are currently only committed to ensuring network stability and not community welfare (interview 9). A new mission for DSOs would be for them to account for energy transitions in their operations, i.e. include distributed energy operations in the running of their networks (interview 12).

Attention was also drawn to looming problems, for which no ready-made solutions are yet available: energy system costs, which in the target areas currently account for approx. 70% of energy retail prices, are expected to rise due to the demand for grid capacity extension to provide reliable electricity for additional appliances in remote areas, e.g. for charging electric vehicles at mountain cabins (interview 1). The emergence of local energy hubs and expectations of associated financial benefits through reductions in grid costs threatens the consensus that national grid costs should be shared, thereby maintaining not only private consumption but also the workplace (interview 2). Any societal discussion of future grid solutions needs to be based on cost transparency.

(vii) Future roles of LRAs in the energy market

Some hesitancy was expressed in selecting or prescribing one single role for municipalities to play in the energy market due to the range of currently assumed roles and functions. In Norway some municipalities are market actors and owners of energy production facilities, particularly hydro. Also, in West Norway municipal ownership of wind infrastructure is possible. Other municipalities focus on facilitation and mobilization of local actors and stakeholders (interview 1). The facilitator role was favoured in all of the other interviews and argued from a number of perspectives: small-medium size enterprises SMEs or citizen groups are unable to organize the energy transition as they are immediately confronted with a number of obstacles, e.g. spatial planning requirements and procedures that they cannot overcome on their own; the neutral role of municipalities in initiating a sharing of resources and ownership is indispensable (interview 8) and even prescribed by the Dutch Climate Agreement [55], although this could possibly be better allocated to the regions (interview 3). In Denmark municipalities already act as facilitators of energy economy processes whose outcomes are by no means certain; this role is needed in all community processes that require dialogue (interviews 7 and 8).

In some areas adopting a facilitator role would entail a needed extension of municipality assignments: energy communities and special purpose vehicles designed to run them represent social development processes and formal municipalities need to be part of these, without necessarily entering financial commitments (interview 12). Where community benefit does not feature in regional spatial planning procedures, local authorities need to be empowered to negotiate the civic component of energy infrastructure with developers, which could prove a complex, novel LRA assignment (interview 6).

Additional active market roles for LRAs include responsibility for setting and achieving carbon reduction targets. In this context, the power-purchase agreements already pioneered by some municipalities in the UK are becoming a promising field of activity; they add economies of scale to smaller distributed energy initiatives. Also, within the energy community framework municipalities need to act as one-stop shops for local initiatives as provided by the CARES mission in Scotland [61], (interview 4). In this context the established right of municipalities to 50% ownership of energy infrastructure was seen to merit reinforcement in Norway (interview 2) and the right of local authorities to deliver services of public interest in Germany would demand a policy turnaround (interview 11).

Other recent policy innovation beyond the transposition of EU market stipulations could prove more important in outlining future energy roles for municipalities. In Denmark the "Green Pool" legislation extends the 20% local co-ownership/community benefits model for wind park developments to all renewable energy installations and stipulates that the ensuing funds be administered by the municipalities. This means that municipalities will act as intermediaries between developers and citizens (interviews 7 and 10). More pragmatic support measures for community energy and support in reaching the national 50% local ownership target in the Netherlands are to be hoped for in the development of the Regional Energy Strategies (interview 3).

(viii) Potential of experimental legislation

Each of the proposals of section (vi) would lead to changes in the constellation of current energy regimes; their adoption is therefore subject to varying degrees of uncertainty and even resistance. Added uncertainty is provided by the paradigm shift that characterizes transition processes and their outcomes, in particular with respect to energy security. The third research question therefore attempts within the selected empirical framework to assess whether experimental legislation as defined by Ranchordás [39] offers a pragmatic policy alternative for testing novel civic energy solutions.

An obvious candidate for experimental legislation in (decentralized) energy is the formalized Dutch Experimentation Decree of 2015 [62]. However, the scope of the ongoing experiment is restricted to investigating modes of access for energy cooperatives to the public grid and does not foresee experiments to test whether new civic energy initiatives could work and therefore falls short of the needs expressed in section (iv) (interview 3).

Although the term “experimental legislation” is not widespread in the targeted areas of jurisdiction or, as in the UK, even foreign to national policy development, its core is clad in alternative terminologies that indicate procedures of similar impact already in place. Examples include the Swedish “testbeds of municipal planning” that are accompanied by scientific evaluation to provide added security (interview 9), strategic projects to experiment with new energy solutions within the existing mandates of Danish municipalities (interview 7) and a variety of pilot schemes in Scotland and Wales conducted within the devolution process to test new initiatives such as shared ownership models. Also, Government-sponsored projects aimed at initiating re-development of key energy market design functions constitute an established procedure^[2] In addition, classic consultation processes on new legislation allow for experimental proposals to align shared ownership regulations throughout the devolved UK (interview 5). In Belgium the term “regulatory sandboxes” is used to experiment with the management of integrated energy transitions, e.g. in the Energyville/Thor Park project [63]. These experiments are intended to meet the need to devise optimized community energy solutions within a protected project arena with a view to adjusting regulations to match (interview 12).

Whilst there is no shortage of ideas for worthwhile experimental projects in the field of civic energy, certain expectations would have to be met for them to replace the creative-disruptive functions of the measures discussed in section (iv): sufficient scope to allow for cross-sectoral synergies, temporary suspension of restrictive administrative rulings, scientific monitoring of outcomes and repercussions and feed-in to a policy process. Also, since civic energy is essentially a social product, the social processes that drive such innovations need to be prioritized without being overburdened by technocratic procedures (interviews 6 and 2). Proposals for experiments brought forward in the interviews that meet these criteria include: cross-border cooperation between Germany and the Netherlands to offset the exclusion of renewables from the congested Dutch grid based on the regional, cross-border cooperation option of article 61 of the Electricity Market Directive (interview 3); experiments in setting up virtual grids to increase economies of scale for renewables (interview 1); development of shared community ownership models beyond the electricity sector to pioneer the use of green hydrogen, district heating networks for new settlements and the integration of waste and water management systems into community energy portfolios (interviews 9, 11 and 12). In the German case an experimental revival of the Stadtwerke concept in a pilot setting was proposed, e.g. to test climate-friendly district heating solutions with a municipal company acting as the contractor; any adaptation of legal framework conditions would need to be based on a positive scientific evaluation. Integrated, cross-sectoral proposals were seen as more demanding: in some jurisdictions the scope of such experiments would require derogation from existing concessions and established territorial protection rights; their projected impact, however, is to demonstrate that state-of-the-art technology can make fears of system breakdowns and blackouts redundant (interview 12). Such a broadened agenda for energy communities is as equally disruptive as the creative-destructive measures presented in section (iv).

Discussion

This section reflects on one methodical aspect of the study before addressing the findings in the light of the research questions posed at the outset and relevant insights from the literature on energy transitions.

Representativeness of the interview partners

All interview-based surveys are unavoidably prone to a degree of subjectivity. In the present case this danger was alleviated somewhat by the facilitator function of all the interviewees: the featured civic energy initiatives have managed to enlist over 3000 civic stakeholders [64] whose narratives are reflected in the documented opinions. Also, the aim of this research was not to present a statistical representation of all active civic energy policy enablers and all current policy restrictions in Northern Europe but to indicate policy areas in need of attention if an energy system change from centralized, predominately fossil-based structures to decentralized, renewables-based regional structures is to be mastered.

The need for disruptive energy policies

The conducted interviews produced diverse answers to the question as to whether creative destruction policy approaches, i.e. policy replacement measures, were needed to make room for the uptake of civic energy. Whereas some of the proposed measures, such as a one-stop shop for cooperative energy permits and support mechanisms, require no policy overhaul but rather a streamlining of administrative procedures, others such as restricted access for community energy to centralized grid networks, imposed restrictions on generating economies of scale for CE initiatives and court rulings prohibiting municipality energy initiatives are symptomatic of entrenched institutional obstacles to initiating sustainable regional development processes through a renewal of energy systems. Such discrepancies are classified by Rogge and Reichert in their analysis of policy mixes for sustainability transitions [65] as “inconsistencies”, consistency and coherence, see below, being the two main criteria for assessing the appropriateness of policy elements and frameworks and their ability to achieve their declared goals.

The question that prompts itself is whether the detected inconsistencies or contradictions between declared regional development policies and energy regime regulations are isolated cases or more of a systemic nature. The EU perspective supports the latter interpretation. The European architecture that is being

threatened by community-owned solar panels is nothing less than the vision of a pan-European Energy Union launched in the 80's and promoted ever since via EU Internal Electricity Market Directives. The core of this reform process, conducted in the name of energy security [66], is characterized by the unbundling of state monopoly structures, enforced via the Third Energy Package of 2009, and the introduction of competition into wholesale and retail markets adding up to a highly centralized European market based on neo-liberal principles and void of climate-related or otherwise motivated public interventions; such interventions are seen to undermine the liberalization considered necessary to achieve the single market [67]. The policy issue at stake is no longer fossils versus renewables; barring implementation this has been settled by the adoption of the EU's RES targets [16]. Lindberg et al demonstrate that decentralization processes, a key component of civic energy, are more contentious than the issue of renewables since they pose a greater threat to the business models of incumbent actors [68]. Decentralization is also seen to jeopardize the Energy Union project [69].

The other end of the scale is represented by Sheer's advocacy for regional energy systems [9] and the pursuit of energy autarky as a contribution to the sustainable development of a region [70]. Support for such endeavours is provided by the progression of isolated CE initiatives to integrated community energy systems ICES [71, 72]. By 2014 modern DER deployment accounted for 25% of total global energy production [73] with exponential growth forecasted due to the boom in intelligent management systems [74]. The conflicting viewpoints that polarize the debate between centralized and decentralized energy systems are not restricted to technical-administrative efficiency criteria; the "threat" perceived by the centralized incumbents and their political representations is one of values: DER systems favoured by CE actors are driven by multiple community values that challenge the single currency of established centralized systems [75].

Both Sheer and energy liberals alike recognize that the current energy market design was never intended to cope with either intermittent energy sources or decentralized actors. While welcoming progress towards a single energy market, Glachant and Ruester concede that the current structure is instable and call for renewed regulatory oversight and a realistic design for the transition process from a high-carbon energy system to a low-carbon system of tomorrow [69]. Energy market policy has yet to come to terms with decentralized disruptive trends and reap the benefits of higher efficiency and lower greenhouse gas emissions [5]. For such an undertaking the creative destruction approach could be deployed as an analytical tool to inventory and dismantle inconsistencies between energy and climate policies.

The search for policy coherence

The term "policy coherence", central to the policy mix framework presented by Rogge and Reichert [65], relates to synergistic and systematic policy processes initiated to counterbalance fragmented policy making that results from system complexity, conflicting interests and entrenched path dependency. The conducted interviews revealed proven examples of such policy coherence, particularly in the context of emerging Green Growth ambitions evident in Danish and Swedish policies [76, 77]. These provide regions and municipalities with extended (budget) mandates to pool local resources and build alliances, cross-sectoral collaborations, and partnerships beyond existing sector regulations in order to promote sustainable regional development. The policies are guided by the assumption that environmental qualities cannot be separated from economic development [76]. In both cases Green Growth processes are used to explore local, decentralized energy solutions. By contrast, European policy is more ambivalent or "heterogeneous": "The current EU energy policy mix strongly favors centralized options with respect to transmission and system operation but supports both centralized and decentralized electricity generation" [68]. Accordingly, the Commission's recent proposals to implement the Clean Energy System element of its Green Deal strategy sets new renewable energy and energy efficiency targets without drawing on potentially productive but disruptive decentralization options [78]

Experimenting with policy experimentation

9 out of 12 interview partners explicitly referred to the potential of experimentation in generating policies that could enable civic energy uptake. The literature on experimentation and even on the sub-discipline of policy experimentation is extensive ([35, 79–81]). Its roots can be traced to Dewey's pragmatist theory, which treats every policy as an experiment [46] and to Campbell's vision of an experimenting society [82]. According to Bernstein and Hoffmann a key recent focus of experimentation, defined as a conscious intervention to disrupt the current state of the targeted system, is climate governance, which has exploded over the last 10-15 years and has proved most effective at subnational levels [83]. The authors argue that such experimentation is highly political and its contributions can be grouped in terms of the political mechanisms of normalization, capacity building and coalition building with due consideration of the power of entrenched carbon lock-in practices.

In their review of climate governance experiments with a specific focus on energy Kivimaa et al attribute the upsurge of experimental actions by municipal and regional actors as a response to the restricted ability of national and transnational governance to address global problems [84]. Maintaining a disruptive perspective on experiments they stress that although they initially may not impose changes in institutions, they are better able to handle the uncertainties and variabilities of energy transitions than the technological and institutional lock-ins that characterize established policymaking. Among the many success criteria for transition experiments they need to have a clear policy (reform or replacement) focus, their learning outcomes need to be systematically evaluated and their scaling-up potential explored. Most, but not all the experiments referred to in the interviews exhibit these characteristics.

The regional actor perspective

Proponents of policy mix analysis such as [85, 86] are keen to stress that a focus on individual policies is too narrow a perspective, if we are to understand the politics and the process of policy making; policy analysis needs to be complemented by an actor perspective. The interviews addressed the possible roles of one actor group that played an active and sometimes dominant role in all the featured civic energy initiatives, LRAs. The case study literature on local energy governance reveals a wide range of roles played by local government beyond its statutory permitting and spatial planning responsibilities. The list ranges from facilitators, innovators, participants, catalysts, supporters, networkers and advocates [87] to niche managers, change agents, process and network managers and "system toppers" [20] and mobilisers of the social capital needed to guide CE projects through uncharted territories [88]. Both Hoppe et al and Hawkey conclude that the success of the analyzed CE initiatives would have been less or maybe even zero if the relevant public officials had not displayed active, engaged, and innovative forms of leadership. Hawkey adds that despite neoliberal imperatives of competition that have complicated and

weakened local governance since the 1980s, the municipal authority is likely to be a key actor due to its local democratic status, its long-term commitment to place, legal powers and duties and control over assets and resources.

The interviews conducted within this study favoured a facilitator role for local authorities in promoting civic energy initiatives - inclusive of stakeholder mobilization - extended by proposals to negotiate the civic benefits of energy systems with developers. These activities have little in common with standardized administration procedures and from a town hall perspective they are decidedly external.

Against this backdrop it is all the more surprising that the EU's Forth Energy Package foresees no distinct role for LRAs in implementing the Electricity Market Directive and that all or any consultations with LRAs are left to the discretion of the member states [89]. Kivimaa et al [37] argue the case for a "reorientation of incumbent policy actors" to allow for effective, potentially disruptive policy adaptation. From a regional actor perspective this would entail a change in the energy regime and at least a partial replacement of corporate policy actors by LRA representation. Otemann et al demonstrate that the institutional arrangement of the energy policy subsystem is decisive for the success of community energy partnerships and advocate a replacement of market-dominated institutional configurations by a corporatist associational order, defined as a system in which state and civil society become part of a single regulatory framework [90]. The call for institutional space for community initiatives is addressed first and foremost to national jurisdictions.

Conclusions

The interviews conducted with local and regional energy facilitators identified a number of active, predominantly local and regional policy enablers of CE. At the same time evidence of inconsistencies and a lack of coherence were identified in several national and European energy policy mixes. This divergence becomes apparent in the light of the EU's ambitious renewable energy target of 40% by 2030 [91] making the European Union the only major region of the world that has seriously tried to integrate its energy and climate policies [67]. It is all the more remarkable that this attempt has been undertaken without drawing on the full potential of public-private DER actor constellations to mobilize renewable energy resources; setting RES targets for this actor group could unleash much needed cross-sectoral innovation, albeit at the expense of a power shift from multi-national incumbents to communities and regions. Monitoring activities related to the achievement of the RES targets are likely to question not the climate-related policy goals but the adequacy of the selected policy instruments with their reliance on energy efficiency and emissions trading. As yet the established energy system has failed to re-invent its supply and value chains to adequately respond to the climate challenge and the needs of sustainable regional development. The design of a resilient replacement system faces many uncertainties and resolvable challenges that are characteristic of all transition processes and calls for experimentation on a wide scale. In the energy policy context the quest for certainty, never a reliable recipe for practical action [92], has traditionally been translated into centralized energy security inclusive of all its inefficient redundancies [93]. A reluctance to engage with uncertainties can only prolong the lock-in and strengthen the grip of the incumbents' logic [94]. If, however, we were to replace the highly emotional but misleading "security" guideline by the more accurate resilience criterion, the growing evidence of the greater resilience of distributed energy systems [95–97] can only encourage disruptive system innovation on a regional scale.

Declarations

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Consent for publication: not applicable.

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Figures

Figure 1

Active civic energy policy enablers and policy levels