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Community energy enterprises in the distributed energy geography: A review of issues and potential approaches

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ABSTRACT

The debate on distributed energy systems is evolving in a way that enlarges the domain of traditional energy policy, especially regarding urban and regional development priorities and community engagement aspects. The present article discusses on the possibility to adopt Community Energy Enterprises as a specific organizational model that may represent a crucial and not yet explored tool to enhance the diffusion of a distributed energy geography, promoting new approaches for community-based energy systems. The crucial issue here is that in the discussion of the current energy system we may refer not only to production unit, but also to ownership, decision- making and local responsibility as regards new forms of provision, infrastructures and organizations. With these objectives, the paper discusses in a multi-scalar perspective the role of these organizations may innovate the governance of the current energy market, as part of a bottom-up based *socio-material* transition in the energy market: mobilizing local factors, institutions and approaches in users and citizens' engagement.

Keywords:

Community Energy;
Distributed Energy;
Urban and Regional Policy;
Community-based Enterprises;

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1. Introduction

The present article focuses on the role of Community Energy Enterprises (CEE) on contributing to the diffusin of the distributed energy2 system [1], by triggering various processes of mobilization of local resources. This contribution argues that these two aspects are partially intersected: the role of these organizations may reverse the way we are used to thinking about urban and regional planning practices and responsibilities related to energy issues. Therefore, this article intends to answer the following research questions: How we define and distinguish CEE organizations within the technological category of Community Energy? Which Regional Planning and Development Policy Issues they may contribute to re-discuss and which "bottom-up" activation policies and tools may be worthy to make their developments both inclusive and viable? The present discussion on distributed energy hinges mainly on questions of technology and engineering; at most, some reflections on the management perspectives are thrown in for good measure.

Meanwhile, it's recently become increasingly clearer the need to widen the view on energy policy, especially regarding issues such as institutional, organizational, social and psychological aspects. The available literature is therefore focused on methodologies and themes that combine the concept of community with the experimentation of renewable technologies and sources [2,3,4]; on the barriers and incentives capable of triggering local cooperation processes [5,6,7]; on the socio-economic and political conditions that favor local participation and mobilization of community energy initiatives [8,9].

The present article is focused on the institutional and organizational implications involved, which may be crucial and to date have received only limited attention (as

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underscored by [10,11]). In this regard, Friedrichsen et al. [12] observe that "the institutional set-up of the [distributed] smart system is still uncertain". Johnson and Hall [13] likewise observe that: "The systemic institutional transformation necessary to support the adoption of community/decentralized energy schemes …[has] received limited attention to date".

The issue here is that a distributed energy system 'distribution' may refer not only to energy generation units but also to ownership, decision-making and local responsibility as regards energy supply [14]. In this perspective, this work intends to be part of the recently born disciplinary framework on energy and social sciences, arising to cast a wider net and include social-organizational and institutional issues alongside the more technical aspects of distributed energy production [11].

This results from what some scholars [15] have underlined as an evident lack of governance innovation to promote the diffusion of a distributed energy system, disrupting the top-down techno-centric structure of the current institutional layout within markets, infrastructures and regulations (that are going to be discussed in-depth in the next sections). The hypothesis is that CEE may be considered as a major attempt to innovate the governance of the current energy system, as part of a *socio-material* transition, involving innovative organizations, institutions and approaches in users and citizens' engagement [16].

The paper is structured into 4 parts: Section 2 is devoted on the description of the taxonomy of CEE, according to specific ownership, management and proximity features; Section 3 highlights three problematic dimensions of CEE in the urban and regional policy debate; Section 4 describes one example of CEE highlighting the policy frameworks in which it has developed its activities, Section 5 is devoted to final conclusion on advantages and risks to take into account in CEE policy-making and planning competences.

The choice to combine a theoretical discussion with the description of a specific example is in the idea of providing a multi-scalar perspective on the topic, in particular to observe the different dimensions of the development processes: highlighting both the policy dimension and the practical aspects that may be jointly considered as necessary conditions to discuss on a CEE-based distributed energy system.

This choice was also driven by the need to affirm a definition of a new interpretative category such as CEE, practically undefined in literature. The reason of this choice also lies in the need to debate of new socio-technical definitions within the Community Energy sector, that include as far as possible aspects of systemic innovation that this new category implies. To some readers this may seem like a daring choice, but the breadth of issues raised by the case and its final policy implications will make a serious attempt to discuss these aspects.

2. A taxonomy of the organizations

Among the various organizations that can be found within the broadest category of Community Energy, the framework of CEE is defined as follows: private organizations, set up according to contracts and participatory and collaborative governance, born as a result of local processes of interest aggregation, exchange and confrontation between actors, resources and production of local advantages [17].

Community Energy it is to be understood as an integrated approach to supplying a local community with its energy requirements from renewable energy or high-efficiency co-generation energy sources. The approach can be seen as a development of the distributed generation concept.

The introduction of this interpretative category is driven by the need to focus on their potential role to promote entrepreneurship and society's learning abilities, facilitative governance and territorial practices that may support the emerging Distributed energy scenario. These motivations can be clarified by looking at three features related to the spatial dimension and social organization of their action, evident in their three main feature: ownership, organization and management principles and proximity.

Ownership: Community energy structures may assume a variety of organizational forms. These may include different technologies used to generate energy as well as varying degrees of community participation [18]. As highlighted by Walker et. al [19], each type may include a variety of financial, organizational and governance forms and may entail, for example, cooperatives of energy infrastructures (the most diffused), but also co-ownership between local charities, enterprises and local governments [20]. In this contribution, the investigation is focused on what may specifically framed as CEE, namely where ownership is shared between local-based individuals (or

shareholders): private investors or associates in a collective investment scheme for energy production, management and/or distribution. Other typologies of mixed ownership (i.e. Energy Service Company) can be excluded from this group within the renewable energy sector, also if these have been implemented through community engagement process and related benefits [19].

Organization and Management Principles: Community Enterprises [21, 22, 23] can be defined as the form of enterprise in which the community is treated as "completely endogenous to the enterprise and the entrepreneurial process" [23, p.310]. These enterprises are keen on developing local energy projects in an open and participatory manner, aiming to deliver benefits (social and economic) to the local community. The key organizational aspect relies on the role of local communities "which create collective business ventures and, through them or their results, aim to contribute to both local economic and social development" [23, p.315].

Proximity: the territorial dimension of CEE is evident during the development process, a complex combination of resources and partnerships that determine their implementation. Given the difficulty of small local players in developing a local energy project, these enterprises are keen on engaging local actors such as local authorities, associations, and other local private actors [21, 24]. The local dimension of a community of investors, local actors and the technologies is an essential factor for the community engagement in exchanging both tangible (i.e. financial resources and physical assets) and intangible assets (i.e. trust, social capital, contextual knowledge). A multiform proximity [25] between the stakeholders forming the enterprise is an essential feature and reveals the relevance for urban and territorial policy analysis to better understand this kind of initiatives. According to this definition, in the present article it is not consider as CEE the aggregation of consumers in an ethical purchasing group, neither energy services based on virtual community relationships, such as peer to peer exchange platforms of energy cooperatives.

3. Theoretical background: dealing with regional planning and development policy issues

The theoretical relevance of the CEE is given by their role in the re-discussion of infrastructure planning practices, community engagement in technological markets and renewable energy developments; three highly interconnected points in the field of urban and regional development policy.

3.1. Questioning infrastructure planning

In strategic planning, for instance, the recognized contribution of networks and infrastructures to local economic development can be considered a "mantra" in regional and urban policy-making [26]. The organizational and spatial dimension of energy networks and infrastructures influence the shape of urban systems [27] and they may have strong implications for governance schemes and institutional arrangements [28,29]. The framework in which CEE works may represent an attempt to question the arguable centralized organization in energy and infrastructures in general, comparing its contradictions and outdated institutional setting with an emerging polycentric energy scenario based on these organizations [30]. In this view, a possible diffusion of CEE can directly influence the infrastructures' power in connecting material and immaterial urban elements - from people to objects and information [31], determining future trajectories of urban and regional development strategies.

In a global perspective, energy infrastructures often remain largely outside the control of local communities [15,24], under the supervision of national regulators and large private companies (service providers, producers, network developers) who in return are paying little attention to community development strategies and initiatives. From a governance perspective, energy infrastructures are relevant, and even major, items, characterized by a strategic nature [32]. They provide the necessary support for diverse urban practices and may also represent a new tool for strategies, referred to specific stakeholders and a larger spectrum of players. These mechanisms can work at different levels since networked spaces across all infrastructural sectors are being constructed, legitimized and maintained – politically, socio-technically, legally and geographically – in different ways [33]. But the greater challenge perhaps is to understand how intertwined networked spaces fit more broadly into what Harvey [34, p. 260-261]. called the 'co-gradience' of contemporary metropolitan life – "the way in which multiple processes flow together to construct a single consistent, coherent, though multi-faceted time-space system". These aspects may represent

crucial challenges regarding the current organization of the energy infrastructure paradigm, historically conceived in a fixed centralized model, with hardly any citizen engagement in energy generation [4].

3.2. Dealing with community engagement in energy markets and innovation policy

Mainstream innovation theory suggests that economic growth and technological change are strongly intertwined, where technological progress elicits new industrial development trajectories and disruptive technologies contributing to the creation of new market opportunities and wealth. The introduction of a *community-led* agenda able to enhance CEE as a new actor in the energy sector must put together these considerations with the developments of the platform economy and digital market-place, a totally new field of action for community-based organizations, with both opportunities and threats. The capacity of digital tools and new technologies may be able to promote disintermediation, fostering businesses specialized in innovative supply chains able to reduce the distance and transaction costs.

Following the global path of disruptive technologies, a CEE agenda can consider the opportunities of the declining cost of distance and the transformation in the supply chain [35, p. 2]: "a significant change in the cost of distance would prompt millions of economic actors to rethink their strategies and investments, and cause individuals to reassess where they work, live and raise their families. The costs of moving goods, raw materials, people and information— all are declining, with some items already in a steep and rapid descent". Moreover, the creation of networks between different practices, new financial and engagement tools (i.e. crowdfunding) and also the unexpected effects given by the combinations of new products and services related to CEE. These factors can on one hand grant rooms for new entrepreneurial opportunities tapping into latent demand, on the other must take into account the asymmetries of information: given from the lack of skills needed to develop these highly innovative projects in certain contexts [36]. In this scenario a major policy objective will be on the need of promoting diffused local capabilities [37] in order to promote inclusion to use exploit the opportunity to connect consumption and production, delivering innovative projects [41]. Crowdfunding, for instance, shows that platforms can also serve as an inclusive basis for lasting businesses and important innovations for CEE investment schemes. Moving from an expert-cantered process to a platform approach increases diversity, leads to high quality results, and generally results in successful outcomes [38]. This observation highlights an overlooked and under-appreciated aspect of digital market platforms and that the reasons why such technologies, services, and business models are welfare-enhancing is precisely due to the possibility to produce incremental benefits through the aggregation of diffuse and local knowledge at lower cost [39,40].

3.3. Dealing with sustainable development and renewable energy agendas

The third relevant point is to explore the implications and benefits of enhancing local community access in the energy sector as a crucial factor for the "low carbon challenge", promoting different forms of energy efficiency and as a measure to contrast climate change [42]. In urban areas, commercial, industrial and residential buildings are still highly dependent on traditional energy resources such as oil, coal or gas - over 80% of total primary energy demand still relies on fossil fuels and a significant share of this goes into our cities built environment [43, p.25–27]. The promotion of an institutional environment able to spread sustainable production and efficiency based on CEE initiatives [44, 45] can also influence built environments, usually organized according to energy resources and energy power systems [46]. The form of the built environment is influenced also by the nature of its fuel supply[3] [47], buildings consume about 30% of global energy production [46].

Contemporary cities are actually largely based on fossil-fuel technologies. Urban areas and residential use are therefore responsible for a large part of greenhouse gas emissions. As Droege [47, p.89–90] writes: "All modern cities have mushroomed on their … fossil nutrient supply… It is appropriate to refer to contemporary urban constructs as fossil cities". The transition from centralized systems based on fossil fuel to more *decentralized* ones based on renewable resources will therefore also have an important effect on spatial configurations. The pursuing of a CEE agenda can hardly be accomplished without a wider policy reform in the field of energy: overcoming monopolies, promoting regulations that may enable disintermediation from a passive energy society to an active one. This process is currently occurring in different sectors, reducing intermediaries in the supply chain, and cutting the middlemen in connection with a transaction or a series of

transactions. Some countries have understood the potentiality of this energy transition and the consequent increase of opportunities related to distributed units of energy productions based on renewable resources.

In the United States, for instance, some local authorities are working to secure the solar grid parity of local production initiatives [48]. The Institute of Local Self-Reliance work in partnership with administrations by elaborating balanced policies that can promote efficient markets, economic autonomy and fair competition for large-scale diffusion of Community Energy Enterprises. Some interesting ideas are also arising from the United Kingdom context, where the research consortium Realizing Transition Pathways has established a permanent observatory on distributed productions and the transition to what they call the "civic energy future" [49]. The study carried out on the English context has observed the technical feasibility of a possible 50% increase in local primary energy production by 2050, compared to the current 1% (ibid). This observatory has been developed the new government framework on the Community Energy Strategy [50], a policy agenda designed to promote incentives and regulation to foster the spread of Community Energy Enterprises. Considering the European picture, in the German [51] and Danish [52] contexts the cooperative production model is the most widespread and is the most financed model by lending institutions. The success of this model has been recognized in the effectiveness of the proposed initiatives, in some countries enabling CEE initiatives able to deal with large renewable energy projects (eg. the *Middelgrunden* in Copenhagen), with significant economic implications for the communities and local authorities involved.

The attempt to ensure fair competition for CEE through *ad hoc* policies is threatening the margins of profits of some large active operators in the energy market [53], which is reflected in intense lobbying and pressures on European legislators to preserve their position [54, p.18].. Compared to this issue, the crucial node is represented by the repositioning of large-utilities in the local energy production and distribution market, threatened by the potential entry of new competitive players and technology [55]. With respect with this analysis, thanks to the recent advances on the use of integrated technology sets, citizens and local authorities may have now the possibility to disruptively enter in the energy market, revolutionizing the way that energy is generated and used today [56,57,58],. The same scenario was hypothesized by the German researcher and parliamentarian Hermann Scheer in the famous essay "The Imperative Energy: 100 Percent Renewable Now," Scheer [59,60], argued that extensive use of renewable sources can only be implemented through many independent initiatives in many different places, by re-organizing the entire system of energy Infrastructure to reach decentralization opportunities.

4. An analytical framework for CEE: The Banister House example

In order to provide the analytical framework for CEE, we refer to a process analysis methodology in order to uncover its implementation strategies and the definition of the management scheme: which stakeholders and resources were mobilized during the CEE engagement process and what types of interests have been instigated and promoted through a certain policy framework. The decision to look at a British example is also due to the considerable attention that has been given by the coalition government to these of initiatives, therefore it should be taken into account that this example refers to an advance for CEE experimentation.

The *process analysis* considers the stakeholders' interactions that have mobilized tangible and intangible resources and have been necessary to establish the community enterprise (Tab.1). The development of these initiatives can be considered as a complex interplay of different forms and dimensions of problems, networks, interests, duties and powers [21, 61, 62, 63]. In light of stakeholder theory [64]., an enterprise can be considered as the result of interaction with different stakeholders, namely any "group of individuals who can affect or is affected by the achievement of the organization's objectives" [65, p.46]. In this case, the *process analysis* is essential to analyze how different stakeholders have reached the feasibility conditions of these initiatives. This includes a combination of different local and national actor's factors: energy policies and interactions between Local Authorities, Project managers (PM), Local Organizations (LO) and the Community of Investors (CoI). The LAs are the municipalities involved in the process, providing spatial assets and financial resources in order to assure the technical feasibility of the electricity production plant. The LOs are the stakeholders that have facilitated the community engagement before and during the share offer, to support the communication and the implementation of the project and its organizational

features. The PMs are the technicians who have led the implementation of the project in terms of technological and financial requirements, producing technical knowledge in order to achieve investor engagement.

Within this stakeholders' framework, we can specify two different assets exchanged during the process: structural and intangible assets**.** For *structural assets*, we consider national policies, such as tax relief and incentives; local policies, such as purchase agreements (or other forms of collaboration and project funding) with local authorities and also financial schemes, technologies, spatial resources (i.e. roofs surfaces) and communication campaigns. For *intangible assets* [66, 67] we consider organizational and relational capabilities (i.e uncodified human and organizational capital) and intellectual competencies (i.e. technical, financial and communicative skills) and also different forms of trust between the CoI and stakeholders that have fostered mobilisation to overcome the barriers that hinder community energy initiatives [68,69]. The process analysis has been conducted through two tools: stakeholders' interviews and qualitative investigation. The interviews were conducted with the Project Managers, about their experience in devising and managing the projects. These were integrated with an additional investigation conducted through enterprise reports and statues and Local Authorities policy reports[4].

4.1. The Banister House Solar project organization

Banister House Solar (BHS) is a Community Energy Enterprise based in the Borough of Hackney, north-east of London. The enterprise has been developed thanks to the experience of the PM Repowering London, a non-profit organisation specialized in facilitating the production of community-owned renewable energy projects. In particular, the Banister project follows the successful experiences of Brixton Energy Solar Co-operatives 1, 2 and 3 where Repowering London experimented with specific community engagement procedures for CEE within the urban context of Brixton, south London. The enterprise's main activity is the production of energy through a rooftop solar panel plant on the 14 buildings at the Banister House Estate for 101.76kWP of total capacity installed, producing 82.000 kWh per year. To assure the use of the rooftop, the enterprise has signed a 20-year life leasing agreement from the LA Hackney Council, the same period of the Government's Feed-in Tariff[5] (FIT). The Tariff together with the selling of the energy surplus produced for the national grid are the main part of the CEE revenues. A part of the energy is also sold under a discounted 'power purchase agreement' with Hackney Council to be used on-site to power the Banister House communal areas. The BHS initiative arises from the decision of the Hackney Council (LA) to commission to Repowering London (in 2013) the Project Management (PM) with the local group of Hackney Energy (LO). This engagement process and the technical expenses to set up the energy production plant were sustained by the policy framework of the Community Energy Strategy, a Department of Energy and Climate Change (DECC) strategy set up in order to "supply enough electricity for up to 1 million homes by 2020 and make significant contributions to reducing energy bills and poverty – and includes measures to help communities and local authorities to scale up activity" [50].

The Project Management expertise provided by Repowering London has been the combination of:

- Technical knowledge: the ability to set up and design the solar panel arrays on the roofs of the housing blocks and preparing the application for the Feed-in tariff and the purchase agreement;
- Engagement of the local community and key local stakeholders in the process, setting up a crowdfunding campaign;
- The creation of a Community Benefit Society, preparing the documents for the social investment scheme;

4.2. The Banister House Solar project management scheme

BHS was registered as a Community Benefit Society (CBS), an enterprise based primarily for the benefit of the community at large, rather than just for members of the society. This means that it must have an overarching community purpose that reaches beyond its membership. CBSs are a replacement of the Industrial Provident Society [71] in the UK social enterprise regulation. To access this kind of legal arrangement the enterprise must have certain specific features, such as a democratic decision-making built into its structure. Although a community benefit society has the power to pay interest on members share capital, it cannot distribute surpluses to members in the form of dividends. To do so the community benefit society can opt to have a statutory asset lock, which has the same strength as the asset lock for a charity and for a community interest company [71].

To date, the BHS statute includes a democratic system of management and decision, where each member has one vote regardless of the number of shares held (Figure I). They meet at Banister House community hall, part of the council estate. The discussion is made with Banister House solar interns, residents and Hackney Energy members. The final decision will be taken at Banister House annual general meeting. The board of directors has the authority to pay annual interim interests' payments without the approval of a general meeting of the Society. The current directors do not presently intend to make any interim payments without approval from a general meeting of society members. The division and distribution of the income generated from the project are in accordance with 4 simple rules:

i) Provision for payback of initial capital investment;
ii) general reserve, payback for the continuation and new investments for the enterprise development
iii) pay and share interest to members'
iv) make payments for social purpose.

According to the Community Benefit Society guidelines, the payment for social purpose in BHS is transferred to a Community Benefit Fund. This fund aims to benefit tenants and resident living in Banister House in a broad sense, not only within the mutual interest of the project shareholders. The amount of profit set aside for the community fund is the 20% of the net profit throughout the life of the project. In addition, BHS invites the shareholders to allocate even the whole of their annual share interest payment to the Banister House community fund. The capital cost of the project consists in £142.540 (this cost was based on the results of the competitive tendering process) entirely provided by the share offer through 126 individual investors (CoI), conducted also by an online crowdfunding campaign. Each share has had a nominal value of £1, the minimum shareholding is £50 for Banister House investors, the external investors between £250 and 42.600 (30% of the total share offer value). Enterprise revenues are composed of:

(i) Feed in Tariff on kWh installed;
(ii) Export Tariff;
(iii) The electricity sold to Hackney Council through a Power Purchase Agreement (PPA);
(iv) Interests on deposits.

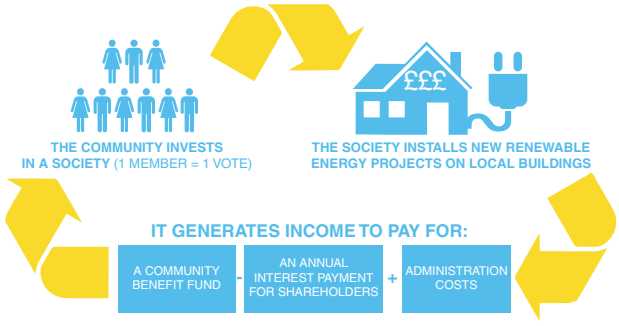

Figure 1. The enterprise scheme and its tasks [75]

The FIT introduced by the UK Government in April 2010 [72, 73] is the principal source of income for BHS. The FIT scheme requires electricity suppliers to pay small-scale renewable energy generators, both for all the electricity they generate (the generation tariff) and for any surplus of electricity they export to the grid (the export tariff). The access to FIT has provided long-term price security, payments under the scheme are guaranteed for 20 years from the date when the installation is commissioned.

The tariff is inflation-linked, increasing each year by the rate of inflation (using the Retail Price Index) of the previous calendar year. The realization of 16 separate arrays on 14 roofs guarantee a total installed capacity of up to 102 kWp. The Generation tariff for installation is for up to 4 kWp is £ 0.1388/kWh generation on pre-accreditation, the generation tariff for systems upon to 10 kWp is £ 0.1257/kWh. In addition, under provisions of the FIT, because each of the eighteen installations is under 30 kWp installed capacity, 50% of the energy generated will be deemed to be exported at an initial rate £0.0477/kWh (inflation adjusted annually). While it possible to install export meters on this project, the financial and administrative cost for their installation and maintenance would outweigh any increase in revenue under the Export Tariff and, accordingly, no export meters have been installed. The sale of electricity used on-site for communal areas to the Council Estate Borough Agency (Hackney Homes) will be measured through on-site consumption meters. The Power Purchase Agreement is for 8p/kWh, annually adjusted for energy price inflation.

Part of the revenues to consider is also the interests on deposits for the repayment of capital. According to the estimation done by BHS in anticipation of earning an average interest of £676 per year over the life of the project. According to these revenues, other costs like operation and maintenance of solar PV equipment, administrative costs, reports drafting, distribution of interest payments and insurance to cover the potential

loss of revenue in case of technical issues must also be considered. In addition to the annual costs, the society must ensure the repayment of the initial principal investments at the end of the FIT (or in event of a withdrawal of shares). According to this estimation done by BHS [74] the general ROI is hence on the approximate value of 4.0%. This allows for 20% of net revenue from the project to be set aside annually for the Banister House Community Fund. Additional aspects on individual investor revenues given from the national Tax Relief Schemes, dependent from Department for Business, Innovation & Skills must also be considered. The legislation giving effect to SITR is at schedules 11 and 12 of the 2014 Finance Act, amending the Income Act 2007 [70]. These policies are the result of the Coalition Government political action for the "Big Society" through the enhancement of Social Investment Market [75]. The tool available for BHS investors is the Seed Enterprise Investment Scheme (SEIS), for the 50% of the Investment. The SEIS recognize the particular difficulties which every early-stage company face in attracting investment, by offering tax relief at a higher rate than that offered by EIS, which will continue to offer tax reliefs to investors in higher-risk small companies. The Income available for SEIS company Tax Relief is the 50% of the cost of the shares on a maximum investment of 100.000 £ (or 30% of stake in a society). The relief is given by way of a reduction of tax liability, providing there is sufficient tax liability against which to set it. Social Investment Tax Relief (SITR) is designed to support charities in accessing equity finance and individual investors offering them 30% income tax relief.

4. Concluding remarks

With respect to the analysis proposed in the two previous sections, we can make some reflections on which possible policy recommendations for policy-makers interested in making CEEs development viable and inclusive, promoting contexts and competences capable to diffuse this kind of initiative.

Regarding the first question we have to acknowledge the potential CEE role in sharing and aggregate community assets, promoting local innovation through certain local and national community development frameworks [76]. As in the case studies analysed, the role played by these organizations requires certain local preconditions in terms of competencies, resources and capabilities needed to develop the CEE. Aspects that revealed common critical points with the next policy agendas have already been included in similar "urban innovation" practices as part of their priorities, most notably in the new EU Urban Agenda [77]. The main obstacle is, on one hand, the economic sustainability of these initiatives and on the other the inclusiveness in terms of accessibility of such agendas within different territories. As underlined by Pasqui [78, p.55], the spread of these highly innovative community developments can be strongly dependent on a "high standard of economic performances and urban infrastructures needed to support these new form of production" rather than eventually "promoting new asymmetries and spatial inequalities". CEE may be limited in exchanging knowledge and information, as any community-based organizations based on private individuals' contractual community agreements. As Ostrom [79, p.659] underlined, "the assumption that individuals have complete information about all actions available to them, the likely strategies that others will adopt, and the probabilities of specific consequences that will result from their own choices, must be rejected in any but the very simplest of repeated settings." Furthermore, even if contractual community agreements may be considered an effective tool to promote communities' economic empowerment and freedom of action, these communities may lead social groups into insulation: ignoring inequalities, disadvantages and asymmetries given by unbalanced power and conflicts that are a matter of fact in certain geographical contexts (i.e. gated communities).

Looking at the analysis developed on the theoretical contribution (Section 2 and 3) and at the specific process outcomes (Section 4), it is possible to advance reflections on (1) The policy recommendations that may enlarge the feasibility of CEE initiatives in any territorial setting; (2) New planning competencies and local capabilities that may be able to favour the development of new initiatives.

Regarding the first aspect, the diffusion of CEE seems to suffer from the unclearly defined regulatory framework in which they operate. Besides the serious effort given by the example of the Community Energy Strategy in the UK, this point is particularly true for the country [24], characterized by the ambiguity of the principles and laws that define the activities of community-based organizations [80], and the lack of specific policies that support community engagement processes. As clearly observed in the example above described, the engagement process requires time and expertise, facing monetary costs that may be dependent on the social capital and the

"civic infrastructures" present in community localities. With respect to this analysis, two crucial points may represent helpful tools to promote new developments:

First, the possibility to set up a loose framework of CEE sectors in terms of activities allowed, leaving the emphasis of their "social purpose" leaving it to third-party assessment based on analysis of monitoring and controls by sampling, on the British model of Community Benefit Society.

Second, the definition of policy tools and indicators to describe the local accountability of Community Energy Enterprises activities, in order to show the ability to achieve and monitoring the relationship between the activity and territorial outcomes in terms social and economic local impacts. It would make it possible to turn the Community Enterprises as equivalent to a legal non-profit organization, with related tax benefits, policy advantages [81] and donation procedures, eliminating the differences in treatment with other non-profit organizations. An example of this model is given by the British legislation on the instruments of *Social Investment Tax Relief* proposed by the *Department for Business, Innovation & Skills* in the 2014 *Finance Act* [70], for such enterprises as defined in the *Co-operative* parameters and *Community Benefit Societies Act* [71].

Regarding the second aspect, the analysis of the specific example of CEEs calls to promote new Competences and Capabilities from and for potential policy-makers, entrepreneurs and individuals able to develop, invest and activate CEEs.

In particular, regarding three specific competencies:

First, the capacity of "systematizing" the involvement of individuals into the entrepreneurial initiative: the ability to set up a contractual tool that may be able to share responsibilities among the members of a local community, drawing rules that define relationships and responsibilities;

Second, the ability to ensure a sustainable investment model in projects. This is necessary both in the sense of *social capital* [82] as the ability to mobilize the network of relationships between local actors and *share capital*, as the ability to promote investments related to horizontal subsidiarity or entrepreneurial participation of citizens in the planning of services and spaces for local communities [83];

Third, the ability to manage priorities and interests of a plurality of individuals; considering the effective participation and representation of needs and expectations in decision-making processes, especially regarding the fair distribution of the benefits generated by collectively owned assets.

From this point of view, the example recalls these issues with particular concern. The conditions of feasibility have been built thanks to the development of these competencies, in which they've based the acquisition of intangible and tangible assets essential to the sustainability of the whole Community Energy Enterprise initiative. These competencies in addition to recent technological advances highlight a promising horizon for these organizations within the reorganization of the energy market, where they can establish the spread in many different territories.

Through the contributions of the present work, it is finally possible to affirm the wide possibilities opened by the innovative perspectives on CEE in urban and regional policy design, resumed in these three final considerations:

First, the perspective on the policy "scalability" of Community Enterprises, considered as "democratic turn" of the "traditional formulas" in capitalist production [84] or as civic action practices in the administrative context of "localism" [85]; enterprises in which are compared local and general interests through institution building processes and social capital production [86], becoming producers of "de facto" territorial policies [87].

Second, the new perspectives on social innovation given by CEE to the whole Distributed energy debate, meant as a cultural and paradigmatic change in the production of economic value [88]. A process that starts with local resources and innovative products, production processes, technologies or the combination of these factors [89]. This framework includes collaborative production formulas based on the sharing of services and resources by pooling approaches (es.*sharing economy*), on innovation in service design (eg. *User-friendly*), and the overall rediscovery of the local dimension (i.e. *prosuming*) in the production of services that traditionally are conceived as centralized: from energy to manufacturing, culture and welfare.

Third, the general regulation legitimacy of new public asset transfers towards CEE, with the aim to promote collaborative governance and arrangements in energy infrastructures: promoting innovation in agreements between citizens and local governments, as well as innovation in collective and community ownership schemes [90].

The limit of the present article is the lack of an in-depth analysis of technological strategies in re-driving

infrastructural development. This can be highly contextual and may necessitate a broader discussion on which energy system CEEs are (going to be) part of, which requires also national initiatives (energy strategies) and government coordination [91,92, 93]. Moreover, it may be possible to add two open questions in order to look forward to future investigations and research on the Community Energy Enterprise sector. First, with the possibility to extend surveys to a large sample of Community Energy Enterprises Through robust quantitative methods analysis, it may be possible to test different features of Community Energy Enterprises and their results in terms of policy outcomes, inclusive developments and financial dynamics. At the same time, it may possible to also observe different behaviours among the Stakeholders in terms of social preferences, environmental awareness and benefits perceived. Second, the necessity to analyse Community Energy Enterprise organizations, policy making and Distributed Energy Scenarios in a comparative European and global perspective.

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ENDNOTES

[1]Distributed energy (or distributed generation) is an electrical generation and storage performance, made of a variety of small, grid-connected or off-grid devices referred to as distributed energy resources (DER). On the contrary power stations such as thermal coal and gas, nuclear powered plants, as well as hydroelectric dams can be considered as large-scale power stations, centralized and often connected to an energy transmission network over long distances. By contrast, DER systems are decentralized, modular and, in certain conditions, may be more flexible technologies, especially because they are usually located close to the demand they serve.