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Postcapitalist Prosumerism: Exploring Simultaneous Practices of Consumption and Production in Community Manufacturing and Community Energy

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Abstract: This paper contributes to the literature on simultaneous processes of production and consumption – otherwise known as 'prosumerism' – in the context of sustainability transformations. We argue that prominent work on prosumerism in recent years has exhibited 'capitalocentrism' and that addressing this bias can bring alternative economic strategies to light. We proceed to define 'postcapitalist prosumerism', outline its potential importance in thinking about eco-social transformation, and identify a number of tentative underlying characteristics, including re-embedding and reterritorialising socio-economic activities, politicising technology, promoting participatory and collaborative governance. Empirical highlights are drawn from two recent projects on prosumer practices related to Community Renewable Energy (CRE) and Community Manufacturing (CM), respectively. We conclude that postcapitalist prosumerism is a heuristic concept which can be useful to explore the transformative potential of sustainable social innovation.

Keywords: prosumerism; post capitalism; Community Manufacturing; Community Renewable Energy; sustainable innovation

1. Introduction

Despite widespread use of the term Sustainable Consumption and Production (SCP), the research literature has remained broadly divided between sustainable consumption – focusing on the use and disposal of material goods primarily at the consumer level – and sustainable production, broadly focusing on questions of industrial ecology and pro-environmental efficiency. However, despite many practices blurring production and consumption, their implications for sustainable transformation remaining little understood (Veen et al., 2021). The task of this paper is to deepen understandings of prosumerism in the literature on SCP. Prosumer activities go a step further than engaging in ethical consumption, as traditionally understood within market economies, instead entailing that practitioners become involved in production for daily needs in various ways (Kosnik, 2018; Spekkink et al., 2022). Below, we draw together conceptual and empirical material to critically investigate the potential relevance of 'postcapitalist prosumerism'.

As we will discuss further below, the 'post-' in postcapitalism is not meant in this paper as a clean break or linear transition, but is an inclusive phrase which incorporates alternatives that exist in the here and now. Using the concept of postcapitalist prosumerism in this sense, we can make both novel and traditional practices more visible, strengthening what Cameron (2022: 42) calls 'the existing economic activities and relationships that are already enacting the type of post-capitalist world that so many of us yearn for.'

By putting literatures on postcapitalism and prosumerism into conversation, we can explore its relevance to crucial contemporary debates around green economy, (post-/de-)growth and pro-environmental action. This lens specifically allows us to rethink eco-social relations in terms of more-

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than-capitalist forms of labour, enterprise, transactions, property, and finance (Gibson-Graham and Dombroski, 2020). At a time of pessimism and debate about alternatives to growth and capitalism (Fisher, 2009; Schmelzer et al., 2022; Huber, 2022), postcapitalist prosumerism can provide examples of tangible forms of co-existence in just and sustainable ways. To this end, our understanding of postcapitalist prosumerism is further developed by introducing empirical research on two relevant spaces of prosumer practice – namely Community Renewable Energy (CRE) and community manufacturing (CM).

The paper proceeds as follows. Section 2 provides the conceptual background for recognising this topic as distinctive and worthy of scholarly attention. Section 3 describes the methodology adopted and introduces empirical studies from which illustrative insights are drawn relating to the fields of community production and community renewable energy, respectively. Sections 4 analyse the empirical material gathered in the two empirical fields in relation to some key features of postcapitalist prosumerism which have been previously identified in the theoretical section. Section 5 draws the conclusions.

2. Theoretical framework

2.1. From Capitalist to Postcapitalist Prosumption

Prosumerism is a neologism coined by Alvin Toffler (1980) to refer to 'the blurring of consumption and production in modern practices' (Eden, 2017: 266). While the study of prosumerism remained a marginal scholarly topic in the decades after its inception (Dusi, 2018; Ritzer, 2015), it has re-emerged in the last decade or so, primarily through its promotion in the scholarship of widely cited sociologist George Ritzer and co-authors (Veen et al., 2021). In the intervening years, prosumerism has been studied across a variety of domains, including: user-generated content on social media and blogs (Ritzer and Jurgenson, 2010); repair practices in cultures of frugal innovation, jugaad and repair cafes (Singh and Arora, 2021; see also Graham and Thrift, 2007); energy, including household renewables (Ellsworth-Krebs and Reid, 2016), biodiesel cooperatives (Fabila-Rodríguez et al., 2021), and community renewable energy (Magnani, 2021; Campos and Marín-González, 2020); food prosumerism and Alternative Food Networks (Veen et al., 2021); freecycling practices (Eden, 2017); Distributed and social manufacturing (Hamalainen et al., 2018); open-source software, such as Linux (Dusi,2018).

Despite this varied and growing interest, prosumerism has only recently been explicitly discussed as a potential remedy for 'overconsumption and its environmental consequences' (Lehner, 2019: 106; see also Singh and Arora, 2021; Ritzel et al., 2022). However, the concept seems well-positioned to contribute to a transformative reconceptualization of production and consumption through the involvement of more- and less-geographically proximate networks and actors (Johansson et al., 2005; Kosnik, 2018; Campos and Marín-González, 2020).

Within the literature on prosumerism, the original split between production and consumption is said to derive from the emergence of industrial capitalism, which displaced the predominant arrangements of self-provisioning characteristic of earlier societies (Toffler, 1980; Veen et al., 2021). Ritzer and Jurgenson (2010: 13) outline a subsequent progression from a capitalism 'dominated by production' (and spatially centred on the factory) to a capitalism focusing on consumption (for which the shopping mall is emblematic). Their work asserts that, in recent years, 'prosumer capitalism' has emerged as the next stage in a linear process. The latter has been overlooked, Ritzer and Jurgenson (2010) argue, due to respective 'productivist' and 'consumptivist' biases in existing social theory which cement the binary between production and consumption.

Contemporary prosumerism, in the account outlined by Ritzer and Jurgenson (2010) and Ritzer (2014), is largely an exploitative process. It is characterised by unpaid labour, the value of which is captured by corporations. Examples of this in the literature relate to customers increasingly doing work in self-service restaurants, supermarkets or petrol stations, which had previously been done by waged employees.

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However, unlike Ritzer and Jurgenson's (2010), Toffler was more open to prosumerism being able to both strengthen and counter capitalism, affirming that 'any significant change in the balance between production for use and production for exchange will set off depth charges under our economic system and our values as well' (Toffler, 1980: 296; see also Dusi, 2018; Antonio, 2015). He prominently pointed to the potential for 'do-it-for-yourself' to displace practices of 'do-it-for-the-market' (Kosnik, 2018: 126), in turn breaking down many industrial spatial divides, such as that between the home (as a space of consumption and social reproduction) and the workplace (as a space of production).

By returning to this original understanding of prosumption, as other scholars have pointed out, we can open the term to 'a heterogeneous range of prosumption manifestations' and improve its 'fruitfulness for future research' (Dusi, 2018: 663). In this paper we aim to do that by supplementing the literature on prosumption with the diverse and community economies (DCE) approach proposed by Gibson-Graham (1996). This last approach emerged in direct distinction to the capitalocentric (neo-) Marxism which Ritzer locates himself within. It instead looks to the diversity of forms through which society reproduces itself, with capitalism being only one (often marginal) economic form, alongside a kaleidoscope of non-market care labour, commoning practices, gift exchange, illicit practices and much else.

These practices constitute a wave of economic initiatives taking place beneath the capitalocentric surface and which attempt to subvert any facile distinction between macro/micro, production/consumption, and structure/agency (Kosnik, 2018; Ritzel et al., 2022). Prosumerism could provide crucial non-market goods and services in this radically different economy, producing less overall but sharing more, and thus creating frugal abundance (Alexander et al., 2022). As Kosnik (2018: 124) puts it, rather than obtaining many of the 'necessities of life' through urbanised 'wage labor and shopping', prosumers bring forms of self-provisioning to the fore.

The term 'ethical negotiation' is used by Gibson-Graham and others to refer to open and ongoing processes which moderate and mediate conditions of interdependence and common existence. This is a specific understanding of postcapitalism which foregrounds non-capitalist practices in the here and now, rather than focusing on a future revolutionary moment or clean break with current systems (Cameron, 2022; Gibson-Graham and Dombroski, 2021; Carlsson and Manning, 2010). While some of these postcapitalist practices are mediated through alternative market mechanisms, much is non-monetary and works in accordance with other social logics (Nelson, 2022; Bliss and Egler, 2020; Johanisová and Fraňková, 2013).

Work in the sustainable consumption literature has recently called for greater attention to be paid to such alternative frameworks. Warde (2022: 19) talks about a 'communal mode of provision' (p. 21) and argues that it 'especially gives hope to many as a basis for a sharing or collaborative economy'. This communal mode parallels the recent uptake of Polanyian thought seeking to re-embed economy in community, society and reciprocation, allowing 'a shift in focus from productivity and competition towards a more active role for the state and civil society' (Thompson et al. 2020: 1175; Novy, 2022; Bärnthaler et al., 2020). It also dovetails with visions of postgrowth and degrowth economics (Barlow et al., 2022), foundational economics (Foundational Economy Collective, 2018), and the more radical interpretations of 'sharing' and 'circular' economies, which go beyond mere green capitalism (Ralph, 2021; Campos and Marín-González, 2020).

From this literature, and building on a DCE framework, we could posit a definition of postcapitalist prosumerism as: practices of simultaneous production and consumption which, under ethical negotiation of shared norms and values among participating stakeholders, subvert economic relations of private capital accumulation, commodification and economic growth. In the following we identify some key features of this postcapitalist prosumerism which will guide our empirical investigation into community energy and community manufacturing.

2.2. Key features of Postcapitalist Prosumerism

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Re-Embedding and Re-Territorialising Socio-Economic Activities

As far back as 1980, Toffler (1980: 292-293) had noted that 'An elaborate market was not necessary when most people consumed what they themselves produced…wherever the gap between consumer and producer narrows, the entire function, role, and power of the market is brought into question'. Postcapitalist prosumerism therefore re-embeds the economy and reduces the centrality of the (capitalist) market. Prosumer organisations reintroduce mechanisms of redistribution and reciprocity into economic relations, combining the production and exchange of goods with the pursuit of social objectives. This unfolds as part of a Polanyian 'countermovement' (Thompson et al., 2020), challenging any singular focus on profit and growth. Postcapitalist prosumerism can then tie in quite closely with other contemporary interests in Polanyian 'grounded cities' (Thompson et al., 2020), municipal degrowth (Schmid, 2023) and foundational, community economies (Bärnthaler et al., 2020).

Through this re-embedding, social orders which exploit humans and nature can be reshaped and re-scaled by collective prosumption practices. While the literature on economic alternatives and (re)localisation has often focused on local food (Pungas, 2019), there are manifold ecological rifts and imbalances in need of addressing across multiple sectors of the modern economy (here we focus on just two: the sectors of energy and manufacturing). Processes of economic localisation can operate as a way to close such ecological rifts (Frankova and Johanisova, 2012). Shielded and advantaged by proximity to users, prosumer enterprises can enhance local livelihoods, rather than relying on profit-seeking external corporations who extract surplus (Douthwaite, 1996). Such a place-based economy can provide stability and buffers in the face of economic uncertainty as well as refocusing 'on influenceable local factors that are potentially more sustainably and equitably transformative of territorial conditions' (Thompson et al., 2020: 1179). Rather than exclusionary and closed, scholars have written of 'open relocalisation' – a term used 'to denote outward-looking communities based in locales with strong humanistic, just and ecologically concerned ethics' (Nelson, 2022: 3; Smith, 2023). This can take the form of a Polanyian tolerant regionalism (Novy, 2022), rather than the intolerant nationalism widely observed in recent years.

Politicising Technology

Postcapitalist prosumerist initiatives engage with technology in line with Illich's (1973) vision of the judicious use of convivial tools: appropriate to their eco-social context and conducive to democratisation rather than elite exclusivity. Rather than assuming technological neutrality, there is a desire to construct and harness particular technological forms and systems, while engaging critically with others (Vetter, 2018). This produces a meaningful technological activism which sees the potential for disempowerment in systems which get too large, centralised or distant from their user community – a long-term concern for ecology movements around the world (Kerschner et al., 2018). However, in no way can we propose the existence of a technological consensus in such prosumer movements – conflict and contestation around what is viewed as an appropriate technology evolves and changes according to technological developments, cultural expectations and distributional conflicts.

Participatory Governance and Economic Democracy

Postcapitalist prosumption facilitates more direct relationships to the means of production (Chen, 2015; Schmid and Smith, 2021). While the end product may be functionally similar to the status quo (e.g., electricity coming out of a socket is the same, whether from community renewable energy or the mainstream grid), this emerges as a democratic project which – through various forms and structures of ethical negotiation – seeks to self-administer and govern.

Inspired by Italian industrial districts10, Johansson et al. (2005: 975) write, 'Organising regionalactivities mainly in the form of small-scale units will allow for the local community to possess higher ownership and consequently gain more power in directing these systems in ways that add

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quality to their lives.' These initiatives enable varying degrees of collective decision-making over how resources and profit are utilised and redistributed within the local community to satisfy particular social and ecological needs (Gibson-Graham et al., 2013). As such, they potentially prioritise tackling socio-spatial inequalities over profit, and the creation of more inclusive societies. Such a radical economic vision of cooperative networks of prosumers is discussed by Dujarier (2015: 467), as part of a 'Utopia of productive democracy' or what Chen (2015: 451) calls 'transformational prosumption'. Whether such structures can meaningfully tackle social domination and questions of power distribution, however, remains an open question.

Collaborative Governance

While state structures have in recent decades taken the role of neoliberal cheerleader of marketisation and commodification, there are also glimpses of possibility for more liberatory interactions by prosumer initiatives with the state, for instance at the local or municipal level. This contestation of neoliberal precepts is often driven from grassroots movements and collectives: rather than waiting for benign state intervention, such movements can push for mobilisation of, for example, municipal ownership of land and key assets. As Thompson et al. (2020: 1177) note, 'the local state can act to enhance and develop the important role of stabilisers in local economic development, not least through its central role in delivering public services, generating social and economic value through innovative procurement and commissioning policies that support a sustainable local economy.' Rather than prosumers stepping in only when the state and market fail, it is possible for more symbiotic relations to emerge, creating out-and-out 'collaborative governance' (Newman et al., 2004; Ansell and Gash, 2008) or 'shared administration' (Ciaffi and Saporito, 2017).

3. Methodology

To explore the topic in more detail the remainder of the paper is based on empirical research conducted by the authors and starting from the question: 'In what ways might prosumerism enable sustainable postcapitalist livelihoods to thrive?'.

We synthesise learnings from two emerging empirical sites of prosumerist modes of provision: 1) Community Renewable Energy (CRE) in Italy; 2) Community Manufacturing (CM) in Germany and Czech Republic. The research on community renewable energy draws on a one-year project undertaken in 2022-2023 investigating initiatives of collective prosumption of renewable energy in Italy. Fifteen cases of community renewable energy were considered, with particular attention devoted to the social benefits of the initiatives and to the communitarian dimension of the projects. The methodological approach was qualitative based on semi-structured interviews with the initiators/founders.

The research on participatory, community manufacturing draws from a two-year project also undertaken in 2022-2023, focusing on practices of prosumerism through community manufacturing in Central Europe in the wake of Covid-19. The research approach was based on semi-structured interviews, site visits and workshops with key participants in ten prosumer initiatives in Germany and the Czech Republic.

3.1. Community Renewable Energy (CRE)

It is increasingly recognised that a greater direct involvement of society in the production and distribution of renewable energy sources is a necessary condition for progress to be made in any just energy transition. Accordingly, growing attention has been devoted both by academic literatures and in public debate to CRE (Lode et al., 2022). Varied models of

CRE have emerged across Europe and beyond since the beginning of the 2000s, thanks in part to generous incentive policies at the national or regional levels, and to the changing availability of technologies. The urgency of this agenda has been further underlined in the wake of the energy crisis linked to the Russian invasion of Ukraine in 2022.

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CRE has been defined by Magnani (2021: 71) as 'new forms of collective action that unite producers and consumers of renewable energies and intend to generate new exchange systems.' A seminal article by Walker and Devine-Wright (2008) proposes to consider as CRE all those projects which, in varying degrees, are developed or managed through an open and participatory process and which produce local and collective benefits. These give rise to forms of management, production and distribution of renewable energy that diverge from traditional organisational models centred on the market or the state.

Some authors explicitly relate community energy to, for instance, radical degrowth approaches. According to Kunze and Becker (2015), CREs can have an agenda of aspirations that go beyond electricity generation and address a "politics of the possible", which seeks to use the limited room for manoeuvre to achieve a gradual change in the organisation of society. Others (e.g., Rommel et al., 2018) are more critical and argue that CREs stand at something of a crossroads, i.e., although many CRE projects have familiarised thousands of people with alternative economic models, there is little evidence of a general change in attitudes towards technology, consumption, or equity. Similarly, Tsagkari et al. (2021) stress that "despite the degrowth potential of these local energy projects, their prospects are limited to revitalizing local economies and empowering local communities, but not necessarily reducing energy use or creating an alternative to the growth orientation".

3.2. Community Manufacturing (CM)

CM, in turn, refers to the possibility for community-led models of production outside of mainstream production networks, which produce for some defined local, community or environmental benefit. A variety of cognate concepts have emerged, such as social manufacturing, open production (Basmer et al., 2015), commons-based peer production (Benkler, 2017) or redistributed manufacturing (RDM) (Freeman et al., 2017). Discussion of the relevance of such terms has increased in recent years, given increasing disruption of global trade and capitalist production networks – whether due to trade wars and geopolitical divides, the Covid-19 pandemic, the invasion of Ukraine or other elements of what has been described as a converging polycrisis (Smith, 2023). Key questions about the future of manufacturing and everyday supply resilience particularly came to the fore in the wake of Covid-19, when inflation soared, trade routes faltered and factories around the world were shuttered for weeks or months at a time. The state and communities stepped in in various ways to direct or control production where markets and capitalist organisation failed, and major questions were raised about social resilience in the face of global supply interdependencies (Gibson et al., 2021).

For many, experiences during the Covid-19 pandemic hinted at the role that distributed and community production can play in times of crisis (Armani et al. 2020), albeit with mixed real-world success (Hepp and Schmitz, 2022). Complementing the production of hand-sewn face masks which occurred around the world, communities of makers developed and produced (often certified) face shields and respirators en masse, on an accelerated timescale (Corsini et al., 2021). Mobilising new technologies for small-scale or custom production, this usually took place either directly in, or coordinated by, open workshops – collective workshops or maker spaces which provide access to tools and materials within a given community.

Interest has turned to how contested deglobalisation processes can be linked to broader frameworks enabling a good life for all while reducing planetary ecological harms (Novy, 2022). With the producer and consumer in the processes which unfold being the same, much of the civil society interest in post-Covid reshoring was less about bringing production 'back' to deindustrialised regions per se, which would ultimately maintain the production/consumption binary (Eden, 2017). Instead, it has focused on embracing new forms of sustainable and postcapitalist prosumption.

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4. Analysis

In the following we explore to what extent our empirical cases of prosumerism - community renewable energy and community manufacturing, respectively - accord with the definition and discussion provided above in particular in relation to the key dimensions emerged from literature on postcapitalist prosumerism.

4.1. Re-Embedding and Re-Territorialising Socio-Economic Activities

With regard to energy communities, the literature stresses that unlike centralized fossil-based energy systems, they can have more significant and positive impacts on the local economy: creating opportunities to stimulate local economic growth, generating employment opportunities, fostering networks among local diversified actors (public institutions, businesses, associations etc.) and developing local resources and skills (Haggett and Aitken 2015; Coy, 2022). Furthermore, our research on energy communities in Italy showed that recent implementation of the European RED II directive strongly prioritises a definition of energy communities as communities of place. Indeed, the current legislation defines RECs exclusively based on their proximity to the primary electrical substation, thus emphasizing geographical closeness. Under this definition long-standing energy cooperative organizations, despite their historical contribution, are not acknowledged as significant players by the authorities (Dudka and Magnani, 2024).

Some studies based on post-place theory (e.g., Bradshaw 2008) challenge the assumption that physical proximity alone guarantees strong social ties and a collective interest in the benefits of a specific territory. In relation to our case studies of energy communities, it is particularly interesting to consider the way they plan to use the economic incentive derived from the production and selling of the energy to the grid. Here we find a mixed situation, with cases where it is used only to the advantage of the members – thus with limited effect on the broader territory – and other cases where it is instead used in part or in its entirety to finance local welfare (from schools, to local associations, to maintenance of the landscape and roads etc.). Particularly virtuous are the solidarity renewable energy communities which include cases that emerge in particularly vulnerable urban neighbourhoods or fragile rural areas with the explicit goal of contributing to the fight against energy poverty and marginalisation.

With regard to community manufacturing, the 'maker movement' (Davies, 2017) had expanded over recent decades around the provision of standalone workshop spaces for local participants or collectives to collaboratively design, produce and undertake civic hacking (Smith, 2020; Hepp and Schmitz, 2022). However, networks of alternative production are now emerging at other scales (Schismenos et al., 2020; Freeman et al., 2017; Smith, 2017). The emergence of Fab Cities (short for Fabrication Cities), for example, has seen commitments made at the municipal level (and often mobilising considerable municipal resources) to produce the majority of a city's needs from within its own boundaries by the year 2054 (Diez, 2016). Now expanding beyond Fab Cities, to create Fab Islands and Fab Regions, these networks are composed of coalitions of grassroots activists, makers, civil society institutions, academics and policymakers who recognise the possibility for local creativity in the face of faltering supply chains.

Complicating any simplistic notions of a community of place, these initiatives also enact a translocal vision often described under the slogan Design Global, Manufacture Local (DGML) (Kostakis et al., 2015; Spekkink et al., 2022). Through this, they work to share decommodified knowledge and expertise globally, while producing for local needs using local resources. As such, the economic vision of much community manufacturing is based around 'cosmolocalism' – a contraction of 'cosmopolitan localism' which Ramos et al. (2021: 23) describe as mobilising 'the mutualization of planetary knowledge for use in localized production, solutions and development, to support positive social and ecological goals'.

CM in the study area focused primarily on production for use, rather than exchange, though the latter is not excluded within certain ethical parameters (for instance, in the case of eco-social

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enterprise). This contrasts with mainstream industrial decarbonisation and industrial sustainability literatures which have been dominated by technocentric and engineering-led approaches, often taking capitalist ownership and manufacturing practices for granted. As such, the search for low-carbon manufacturing alternatives has often shown little appreciation for participatory and socially embedded production. By contrast, proponents of CM point to potential benefits such as increased societal relevance, reduced environmental impacts (e.g., from reduced transportation of goods, or increased availability of repair practices), the creation of inclusive and participatory local economies, reducing dependence on global supply chains, and increased economic dynamism and creativity (Kohtala et al., 2020).

4.2. Politicising Technology

With regard to energy communities, the literature stresses that in general these projects – if compared with government- or business-led renewable energy projects – are characterised by a use of technology that is more fitting with the socio-spatial characteristics of the territory and of the local community (Seyfang et al., 2014; Tarhan, 2015; Yildiz et al., 2015). This results in a higher level of acceptability of renewable energy technologies (Devine-Wright, 2011).

In general energy communities are mostly based on solar photovoltaics. This is also linked to the new European regulation that, by putting a strong emphasis on proximity between consumers and the production plants, de facto limits other technologies especially in urban areas. The plants are also often of a small-to-medium size. This is also linked to the national regulations on energy communities: in Italy, recent regulations establish that size of the plants of community energy is limited to a maximum of 1 MGW. Energy communities are thus based on a rather simple and standardised technology, which makes them suitable even for social actors with little technical know-how and low-to-medium investment capital. In short, they are characterised by low entry requirements, high accessibility and mainly employ flexible and modular technology.

On the one hand, in some territories, small collective PV plants are explicitly presented as an alternative to the highly conflictual model of large-scale terrestrial PV plants or large-scale wind parks which have been built especially in Southern Italy by multinational companies exploiting local resources without contributing to local development. On the other hand, in ongoing debates, some critics argue that by limiting the size of the technology of energy communities by law condemns such socio-technical niche to remain marginal in the energy system.

The question of appropriate technology is also central to community manufacturing, with respective initiatives existing to provide affordable access to a vast range of small-scale production technologies, as well as the knowledge of how to use them. Today, this often takes the form of prioritising the development and use of open-source hardware (that is, hardware for which the plans are openly shared and freely accessible), with 3D printers, laser cutters and CNC mills being the most emblematic technological objects. These are purported to facilitate 'lower energy throughput, user autonomy, and inclusivity' (Priavolou et al., 2022). However, while lauded for their ability to shorten supply chains, the actual sustainability impact of the most prominent technologies engaged within these communities, such as 3D printers, is debated – a topic which is in need of further research (Priavolou et al., 2022). In particular, there have been discussions of rebound effects and wasteful production (Priavolou et al., 2022). A range of grassroots innovations have ensued, such as the international project Precious Plastics, who work with makerspaces to maximise the recyclability of their production (Spekkink et al., 2022). Some of the work undertaken is thematic in focus. For instance, the organisation House of All, in Hamburg, Germany, focuses on textiles, providing common space and access to spinning, knitting and sewing machines, among others. Much of this equipment is expensive and usually out of the reach of non-industrial scale makers and creatives.

Another approach taken by the studied initiatives is to salvage disused, sometimes broken, older machinery (such as from schools who are closing their workshops or businesses which are shutting down), making it available to a community of users once again. There are challenges to this emergent

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circular prosumerism, of course, not least finding affordable non-residential space for these technologies in heavily commodified urban property markets (Schmid and Smith, 2021; Freeman et al., 2017). There is also evidence of a failure of wider bureaucratic systems to adapt to the small-scale nature of the technologies used. The creation of this shared infrastructure must confront the Euclidean zoning system which has generally assumed large-scale polluting technologies and thus relocated production to the outskirts of urban areas (Nawratek, 2017).

4.3. Participatory Governance and Economic Democracy

With regard to energy communities, most tend to adopt the juridical form of the cooperative which is usually associated with economic democracy and energy citizenship. However, it is important to note that very different experiences of energy prosumption can be identified under the same overarching label of the renewable energy cooperative. For example, Candelise and Ruggieri (2020), in an article surveying the situation of CREs in Italy, talk about diverse institutional arrangements that account for differences in financial structure and participatory governance. In particular, they highlight that some initiatives are characterised by greater orientation towards economic profit. However, this is accompanied by limited citizen participation in the ordinary administration of each plant. On the other hand, other projects, in the face of extremely limited or non-existent economic returns for members, are characterised by greater attention to participatory governance through the organisation of a nodular structure that aims to promote direct access to citizens.

Similar conclusions have also been reached by our research, which identifies diverse types of renewable energy cooperative organisations resulting from the interaction between geographical characteristics, local institutional system – formal and informal – and motivational actions of the leaders who initiated the project. Firstly, we find CREs emerging from the initiative of ecopreneurs who are mainly focused on mutual profit rather than the public good. However, we also find CREs emerging from networks strongly rooted at a territorial level and characterised in a sense of values oriented towards the themes of participation, self-management, solidarity and environmental sustainability.

In terms of governance and economic democracy, community manufacturing takes very diverse forms in different spaces. Contrasting with community energy projects which tend to emerge as formalised cooperatives, these are usually incorporated instead as non-profit associations, the goals of which are first-and-foremost to benefit its members without making a profit. Such collective associations are governed by an elected board and are under member control, reflecting the commons-based ethos by which open-source hardware communities. The different forms of manufacturing which emerge, however, do not always exceed capitalist or growth-oriented practices. Indeed, a tension is commonly managed in maker spaces between the commercial and non-commercial use of collective maker infrastructures (Smith, 2019; Vincent, 2023). This hints at the ethos of urban entrepreneurial innovation evident in many 'maker' initiatives (Kohtala et al., 2020), aiming for some private benefit, rather than equitable social participation, economic democracy or sustainability. Social and ecological goals are usually foregrounded, however, by giving non-commercial and humanitarian uses priority in the production queue. Previous research has also found very informal democratic processes in place, described as a 'do-ocracy' whereby decisions are made by those who will act on them (Smith, 2019).

Prosumer manufacturing networks in Germany exceed singular maker spaces and bring together a range of stakeholders. CSX (Community Supported Everything Else), for example, has emerged in Germany as an elaboration of well-known alternative economic practices of Community Supported Agriculture (CSA) (Bonfert, 2022). CSX echoes the CSA approach of creating common organisational structures between producers and consumers, which shelter community-based production from the market, often through pre-financing and guaranteed community markets. This is for mutual benefit, reducing risk and exposure to market pricing, but almost always foregrounds

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eco-social goals too. This organisational model, according to proponents, is transferable to a variety of domains, including processed food and drinks, but also durable consumer goods.

4.4. Collaborative Governance

Regarding the energy communities studied, in the majority of cases collaboration with public authorities (mainly municipalities) play a crucial role. In some cases, for instance, mayors are key initiators of the project. In this case, the establishment of the community energy project is understood as an element of a wider planning process for the energy issue previously started by the local public administration. In other cases, the municipality tends to collaborate and join the initiative of the promoters by, for example, offering public buildings for PV installations or constructing the same PV plants through different types of funds such as regional funds, funds from the Ministry of the Interior, European funds or funds from banking foundations. In such cases, the public authorities are parts of the community energy project and can favour the use of incentives to strengthen public services (like education, sport, maintenance of the territory) for local citizens or to address energy poverty.

While traditionally run by a group of private citizens, and therefore not coming under the purview of public infrastructure, community manufacturing has increasingly emerged as a topic of interest to (especially local) governments. European Fab City projects, for instance, are coalitions which are either instigated, or include, local authorities. The latter see such initiatives as contributing vibrancy to post-industrial spaces, or aligning with visions of circular and sustainable cities, and municipal resources are therefore mobilised to support them. In Germany, this can take the form of funding provision, as well as low-cost access to city-centre space through zwischennutzung (interim use) agreements. Other community manufacturing initiatives, although open to the public, are linked to public institutions such as universities or libraries, and large-scale funding has been obtained by international networks of community manufacturers, in the form of European Union project funding.

5. Conclusions

Recent years have seen an increased interest in how prosumerism can challenge ‘capitalist logic and [how] it can contribute to alternative, less materialistic forms of sustainable consumption’ (Veen et al., 2021: 259; see also Ritzel et al., 2022). In a world facing disruption from pandemics, climate change, conflict, economic crisis and social inequality, prosumption is likely to continue to become more and more relevant (Ellsworth-Krebs and Reid, 2016). This paper set out to retain “the original understanding of prosumption’ (Dusi, 2018: 1) and to use postcapitalist prosumption as a heuristic concept to explore the transformative potential of CM and CRE.

As the above analysis highlighted these two case studies of sustainable innovation try to enact alternative social practices concerning the territorialization of economic activities, the role of technology, the form and features of governance and democracy. In doing that the prosumer initiatives discussed here face profound policy challenges and contradictions, whether this relates to the monopolist ownership of the electricity grid in a particular place, or planning laws designed to separate production from consumption in urban spaces (Ferm and Jones, 2017).

Moreover, ambiguities arise in any movements or initiatives navigating social transformation in societies already marked by intense inequality and contradiction. Inclusive potential can quickly fall by the wayside when community energy is co-opted, for instance, or when financial or other barriers confine prosumer activities to certain privileged groups. With both CRE and CM, there is a need to differentiate potential buzzwords from real alternatives which produce meaningful change: Not all ‘open production’ is sustainable or desirable, for instance (Kohtala, 2015; Lehner, 2019), and, many maker activities are marred by the unnecessary production of pollution and waste. Similar questions have been raised about the lifespan, sustainability and input sourcing for renewable energies of various kinds. Further questions remain, also, around justice and inclusion: for instance, in cases in which community-based prosumers are motivated by mutual profit, what renewed exclusions will emerge? Prosumerism can itself become a marker of distinction and exclusion (Kosnik, 2018).

Finally, some of the examples discussed may seem irrelevant or small-scale when compared, for example, to the broader industrial transitions literature. However, the postcapitalist thinking tends to operate with different scalar imaginaries (Gibson-Graham et al., 2013). In particular, the proliferation of diverse viable local alternatives can replace the desire to quantitatively scale up to 'compete' with incumbent systems. Instead, prosumerism can build on, and amplify, prior local traditions and cultures, or 'scale out' these models, moving out of their niche (Vickers and Lyon, 2014), in order 'to affect more people and cover a larger geographic area through replication and diffusion' (Moore et al., 2015: 71). In some places, a long cooperative tradition underpins community experiments in energy and sustainable manufacturing. In others, collective or commons-oriented traditions will need to be more consciously revived or cultivated anew through appropriate 'scaling deep' strategies.

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