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2019

Faculty of Social Sciences

Faculty Publications

This is a postprint version of the article.

The final publication is available at:

Wyse, S. M., & Hoicka, C. E. (2019). “By and for local people”: assessing the connection between local energy plans and community energy. *Local Environment*, *24*(9), 883–900. https://doi.org/10.1080/13549839.2019.1652802

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‘By and For Local People’:
Assessing the connection between Local Energy Plans and Community Energy

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Abstract
"Community energy" (CE) is argued to be an opportunity to transition to low-carbon energy systems while creating additional benefits for local communities. CE is defined as energy initiatives that place a high degree of emphasis on participation of local community members through ownership and control, where through doing so, benefits are created for the community. The trend has seen considerable growth in many countries over the last decade. Occurring simultaneously is a trend for individual communities to create their own Local Energy Plans (LEPs)—a planning process that articulates energy-related actions for a local community (e.g. municipality). While CE and LEPs both address energy activities in a local context, any further connection between these trends remains unclear.

This research develops a framework, based on CE and LEP literature, to assess LEPs for their relevance to CE. The research analyses 77 LEPs from across Canada for the ways in which they address the three components that define CE: community participation, community ownership, and community capacity. The main findings are that LEPs have emerged as a process that is both relevant to CE and capable of strategically addressing its components. Despite this, LEPs do not appear to reveal a radically different approach to the "closed and institutional" models of traditional community involvement practices. The investigation suggests that for CE advocates, LEPs may be considered to be an important avenue to pursue CE ambitions. LEPs could increase their relevance to CE by improving the processes and actions related to all three CE components.

Keywords:
Local Energy Plans, Community Energy, Community Participation, Localism

1 Introduction

A transition to renewable and low-carbon energy systems is central to mitigating climate change. Securing this transition, however, faces the challenge of developing sufficient energy sources without destroying local environments, overrunning costs, and producing negative social impacts for local people. With such issues creating significant public opposition to large, centralized low-carbon energy projects (Devine-Wright, 2010; Kirchher et al., 2016; Nüsser, 2003), finding new, effective strategies for low-carbon energy is crucial. One possible strategy is community energy (CE), where, in contrast with large, centralized low-carbon energy projects, CE consists of energy initiatives that emphasize local community participation through ownership, and control, where through such processes, benefits are created for the community. CE has gained traction in many jurisdictions globally over the past three decades, including the United Kingdom, the United States, Australia, Denmark and Germany (MacArthur, 2017). Its proponents argue that it offers a serious alternative to traditional energy systems (Hoffman and High-Pippert, 2005), since CE initiatives are both *by* and *for* local people (Walker and Devine-Wright, 2008). This view emphasizes two dimensions: process and outcome. The process dimension describes who a project is developed and

run by, and ranges from "closed and institutional" to "open and participatory"; while the outcome dimension concerns the distribution of benefits, whether the economic and social benefits are felt "distantly and privately" or "locally and collectively" (Walker and Devine-Wright, 2008).

Another emerging trend across jurisdictions globally is the development of Local Energy Plans (LEPs) (e.g, Tozer, 2013; St. Denis and Parker, 2009; Ivner et al., 2010; Neves et al., 2015; Sperling et al., 2011). LEPs provide a process to develop strategic vision documents that outline the energy goals of a local context or community (Ivner et at., 2010; Neves et al, 2015; Tozer, 2013). Within LEPs, goals—that is, expected outcomes—are generally articulated as actions. As an action, for example, an LEP could establish a vision for how a community might develop renewable energy locally. Both CE and LEPs address energy activities as they occur in local communities. As process documents that define expected outcomes, LEPs have the potential to strategically address community energy. However, any connection between these two emerging trends of LEPs and CE has received little attention and is not well understood. This research therefore addresses this gap by investigating: how are LEPs, through (1) their processes for plan development and (2) the articulated actions contained within them, relevant to CE?

The paper begins with a review of literature related to both community energy and local energy planning: in sections 2.1 through 2.2, CE is conceptualized and defined according to its core components; in section 2.3, LEPs are defined, main issues are explored, and key features and processes of plans are discussed; and, in section 2.4, the linkages between CE and LEPs are explored. Section 3 briefly reviews the study's Canadian context and some unique challenges for Canada's energy system. Section 4 provides an overview of data-gathering methods and the framework for analysis. Section 5 presents the results, including findings specific to the Canadian context, plan development processes and actions articulated within plans. Finally, section 6 discusses the findings in connection with the three identified components of CE—community participation, ownership and capacity.

2 Literature

2.1 Defining Community Energy

Precisely defining community energy is challenging, largely because no consensus exists concerning the term and different actors may presuppose varying degrees of community involvement (Seyfang et al., 2013). Walker and Devine-Wright (2008) argue that the "ideal" CE

project incorporates both "process" (i.e. who a project is developed and run *by*) and "outcome" (i.e. who a project is *for*). For them, an "ideal" CE project is "driven and carried through by a group of local people and which brings collective benefits to the local community (however that might be defined)—a project that is both by and for local people" (Walker and Devine-Wright, 2008, p. 498).

CE is associated with a wide range of outcomes, particularly for local communities. The wide range of outcomes postulated in community energy literature, however, often relies on diverse assumptions about processes such as ownership, participation and decision-making, therefore contributing to the ambiguity of the term (Devine-Wright and Wiersma, 2013). Berka and Creamer's (2018) comprehensive review outlines the following outcomes commonly associated with CE: socio-economic regeneration, access to affordable energy, knowledge and skill development, improved social capital, increased local support for renewable energy, energy literacy and environmentally benign lifestyles, and community empowerment. Despite such wide-ranging claims, there is a lack of empirical research investigating how such benefits actually accrue (Berka and Creamer, 2018; Seyfang et al, 2013). Instead, CE research has tended to focus on factors influencing uptake and successful implementation, rather than measuring impacts, leaving the evidence supporting claims of benefits to be largely anecdotal (Berka and Creamer, 2018). Researchers have therefore called for a more systematic and comparative empirical approach to CE research (Berka and Creamer, 2018; Seyfang et al., 2013).

As the following sections will demonstrate, CE literature emphasizes several defining characteristics of CE. Based on a review of CE literature, this paper defines CE as energy initiatives that emphasize community participation through ownership and control, where through doing so, benefits are created for the local community. Furthermore, CE is characterized by an emphasis on community capacity, where, as the following sections will explore, capacity is a necessary component of participation (MacArthur, 2016; Berka and Creamer, 2018). This investigation will therefore focus on CE's three core components: (1) community participation, (2) community ownership, (3) and community capacity.

2.2 Components of Community Energy: Participation, Ownership and Capacity

2.2.1 Participation

How local communities participate in energy developments is a defining feature of CE, where a high degree of community participation is emphasized (Walker and Devine-Wright, 2008). The CE term theorizes initiatives that both incorporate citizens' policy prescriptions and engage their active

participation in energy production, delivery and consumption (St. Denis and Parker, 2009). CE proposes open participatory practices built on "dialogue and the conditions of responsiveness, user democracy, and citizen involvement," (Hoffman et al., 2013, p. 1750) as opposed to closed practices that belong to institutionally-driven traditional systems (Hoffman et al., 2013). Hoffman and High-Pippert (2005) argue that while traditional energy systems in the industrial world have demanded autonomous decision-making processes made by "technical elites," CE offers a serious alternative to traditional energy systems. These new approaches tend to emphasize "process" and strengthened community participation, associating CE with "bottom-up" rather than "top-down" processes, entailing the meaningful participation of diverse community actors (Devine-Wright and Wiersma, 2013). Participatory practices may be instrumentally useful due to the inclusion of a more comprehensive evidence base drawing on diverse, local perspectives (Groves et al., 2013). Seen in this way, meaningful participation may be seen by state actors as a useful tool to reach their goals, due the opportunity to overcome distrust of government, "elites", or the basic nature of problems being addressed (MacArthur, 2016). Alternatively, communities may pursue CE practices from a social justice standpoint, creating participatory structures that recognize and redress historical injustices from multiple perspectives (Walker, 2009).

Meaningful participation means that people have "a voice that is listened to, are involved in processes that affect them, and can themselves initiate action to make desired changes" (Berka and Creamer, 2018, p. 3410). Informing CEs conception of meaningful participation, researches have built on broader participation literature (Devine-Wright et al., 2016) such as Rowe and Frewer's (2000) categorization of public engagement mechanisms. These authors categorize three types of engagement: (1) communication, which refers to one-way flow from the 'sponsor' (i.e. local government) to the public involving mechanisms such as newsletters, information broadcasts, internet-based information and question-and-answer style meetings; (2) consultation, which refers to two-way flow between these actors, where substantive dialogue between them is lacking, and involves mechanisms such as focus groups, surveys and interactive websites; and (3) participation, which refers to two-way exchanges of information with the possibility of transformed opinions on both sides, and includes mechanisms such as action planning workshops, citizen juries, consensus-based conferences and town meetings with voting options (Rowe and Frewer, 2000).

2.2.2 Ownership

Within CE literature, ownership is frequently cited as a defining feature of CE and is considered to be "intrinsically empowering" for communities (Berka and Creamer, 2018). McMurtry (2018) defines CE as "community ownership of, and participation in" energy activities (McMurtry, 2018, p. 975). Seyfang et al. (2013) also define CE as projects where communities "exhibit a high degree of ownership and control, as well as benefiting collectively from the outcomes" (p. 978). Some CE proponents argue that local energy ownership is a promising participatory design form (MacArthur, 2016; McMurtry, 2018), and that CE is less exploitative than private schemes due to both a greater subjective sense of ownership and formal ownership. Considerable research demonstrates that communities empowered to shape their own energy systems through ownership opportunities are more likely to accept locally-sited alternatives and low-carbon energy developments (Warren and McFadyen, 2010; Fast et al., 2016). Meanwhile, weak ownership opportunities are associated with a co-optation of CE, where CE policies may be designed merely to reinforce dominant interests, rather than representing a challenge to traditional systems (MacArthur, 2017). Ensuring powerful educative ties and supporting incentives accompany community ownership is therefore important for ensuring meaningful opportunities (MacArthur, 2016).

A variety of CE ownership models have been explored in literature. McMurtry (2018) includes co-operatives, the MUSH sector (municipalities, universities, schools, hospitals), non-profit organizations, community investment funds, and Indigenous ownership; Hoicka and MacArthur (2018) include co-operatives, municipalities, charities and Indigenous communities, and also add community trusts, community associations, and partnerships/joint-ventures. Of these models for CE ownership, co-operatives have been prioritized due to democratic governance through legislated participatory decision-making (McMurtry, 2018) and value-driven, rather than profit-driven approaches (Klagge and Meister, 2018). Through co-operatives, formal community ownership titles (i.e. members' shares) represent a meaningful alternative to traditional energy models due to an emphasis on democratic principles as well as non-financial outcomes (e.g. social and environmental benefits) (Klagge and Meister, 2018).

2.2.3 Capacity

CE literature warns that community participation in energy initiatives is not automatically equitable, as some members within communities have a greater capacity to participate than others (Creamer et al., 2017). The potential for participation that incorporates marginalized and non-traditional actors requires that constraints on these populations are taken seriously (MacArthur,

2016). When members of a community lack the capacity to participate (e.g. lower levels of education and income), only the "usual suspects" within a community may feel empowered to participate (Berka and Creamer, 2018). MacArthur (2016) also raises concerns about the capacity of community members to access participatory mechanisms—such as deliberative polling, citizen's assemblies, and online referenda—arguing that constraints on marginalized and non-traditional actors must be addressed in order for such mechanisms to be equitable. Without addressing capacity, mechanisms may merely be symbolic actions, rather than robust systems in which participation results in tangible policy power (MacArthur 2016).

Catney et al. (2014) warn against falling into the "local trap" which construes initiatives as socially beneficial merely by being local. In reality, they argue, there are two visions of localism: "positive localism," in which the state plays a key role in developing a vibrant society through recognizing that the capacity of different groups in society remains uneven across class, race and other factors; and "negative localism," a modality of neoliberalism that selectively empowers community groups as a low-cost alternative to state action. In this context, local initiatives employ the language of "empowerment" while neglecting social justice concerns and ignoring groups and communities poorly positioned to participate in localist approaches (Catney et al., 2014). Researchers therefore distinguish CE from traditional energy models, in part, by their deployment of inclusive and capacity-building processes.

2.3 Local Energy Plans

LEPs provide a process to develop strategic vision documents that outline the energy goals of a local context or community (Ivner et at., 2010; Neves et al, 2015; Tozer, 2013), where energy planning is meant to not just prepare for the future, but also "create more desirable futures" (Larsen et al., 2011). Local energy plans are extolled as precursors to a transition from large, centralized energy systems to a more distributed network of energy generation (St. Denis and Parker, 2009), which will be required for the development of a sustainable energy supply (Connolly et al., 2019).

The emergence of these plans represents part of an ongoing paradigm shift from centralized energy supply towards a decentralized, bottom-up management approach. Local authorities, such as municipalities, are expected to be major actors in both climate change mitigation efforts (Neves and Leal, 2010; Neves et al., 2015) and strategic planning for local energy systems (Sperling et al., 2011). Neves et al. (2015) note that local energy planning initiatives have grown significantly over the last decade, and that this decentralization of planning may better suit local circumstances

and needs. They argue that LEPs increase citizen participation in local government, which may lead to greater local support of resulting energy initiatives (Neves et al., 2015) and more rational, legitimate decision-making (Larsen et al., 2011). Top-down energy planning initiatives sometimes create challenges for local communities—for example, top-down initiatives may focus on broader climate change mitigation goals and neglect local development (De Pascali and Bagaini, 2018); the capability of local communities to implement plans may be inadequately accounted for (Rakshit et al., 2018); and policy decisions taken by higher levels of government may negatively affect opportunities for communities (e.g. investment opportunities) (Miron, 2014). Despite such challenges, however, local planning may still require top-down decision-making at different regional scales (Faller, 2014). Researchers caution that many well-intentioned local plans may be too uncoordinated, necessitating a more integrated planning system linked to national objectives (Sperling et al., 2011). Additionally, commonly-cited challenges at the local level include low financial and organizational capacity (Connolly et al., 2019; Tozer, 2013), and jurisdictional constraints which limit municipal control over local energy options (Tozer, 2013).

Neaves and Leal (2010) investigate the role of local energy sustainability indicators in LEP processes in 10 plans (five US and five EU municipalities), where indicators are used to evaluate actions articulated in plans (e.g. energy use per capita or CO_2 per capita as a means to evaluate relevant actions). Only a small number of indicators, however, were found to be common or similar between the plans assessed within the study (Neaves and Leal, 2010), which may suggest varying priorities amongst LEPs. Some common indicators include greenhouse gas and energy use reductions, share of renewable energy in energy and electricity use, and household energy use (Neaves and Leal, 2010). Mackres and Kazerooni's (2012) report for the *American Council for an Energy-Efficient Economy (ACEEE)* on 30 LEPs in the U.S., however, reveals broad similarities among LEP actions—specifically, the vast majority included greenhouse gas emissions as the dominant goal metric (Mackres and Kazerooni, 2012).

A number of institutions provide guidelines for the development of LEPs, where a certain degree of homogeneity among various jurisdictions is revealed—at least in terms of *recommended* features and processes. For example, within the methodological guidelines for local energy planning provided by both the U.S. Department of Energy (2009) and the European Commission (Intelligent Energy Europe, 2012), the guidelines provide frameworks for plan development processes that will lead to the articulation of actions in plans. Their guidelines both stipulate that

stakeholder identification and engagement ought to occur prior to the articulation of concrete actions. Following from such guidelines, specific LEP actions largely depend on particular local contexts and are guided by stakeholder involvement. Similarly, QUEST, a Canadian organization that promotes the uptake of local energy plans, outlines phases for guiding plan development, where stakeholder engagement processes occurs prior to the articulation of actions (QUEST, 2013).

2.4 Linking Community Energy and Local Energy Plans

A library database search reveals an underdeveloped connection between LEPs and CE within academic literature. The *Environment Complete*, *Web of Science*, *JSTOR*, *Social Science Abstracts* and *Google Scholar* databases were all queried for publications discussing local or municipal energy plans alongside "community energy". The search found few peer-reviewed papers that place LEP documents in the context of community energy. Researchers are, however, beginning to consider local energy planning relative to CE's core components: community participation, ownership, capacity.

Ivner et al. (2010) suggests that greater attention is paid to project-level participation, and that participation in planning processes is under-represented in research, despite some clear concerns. In Sweden, for example, a noted early adopter of LEPs (Acosta et al., 2008), an investigation of 10 LEPs found unclear use of the concept "stakeholder", which could refer to the general public but more usually referred to specific subsections of the local community (Ivner et al., 2010). It is argued that an undue focus on specifically-targeted actors might reduce participation rates among unorganized segments of the community, and that a broader diversity among participants helps legitimize the energy plan and contribute to the collection of local knowledge (Ivner, 2009). Larsen et al. (2011) point out, however, that even when diverse participants are provided with direct access to policymakers, the impact of such participation on decision-making is unclear. For example, suggestions from citizens in one UK case study were seen as a "smorgasbord" of ideas from which policymakers could pick and choose at will or at whim (Larsen et al., 2011). Ivner (2009) also warns that an overuse of consultants poses a risk that local authorities will lose access to important perspectives, and may create a knowledge gap and delegitimize the LEP. While the value in municipalities using consultants when they lack internal capacity is recognized, the practice should be "handled with care" (Ivner, 2009).

Miron (2014) explores the economic and social effects of a local energy plan in Romania, and finds that while the resulting initiatives could have a significant positive impact on the town's economy, improvements are needed in relation to community participation. It is argued that the plan failed to leave space for community involvement as well as community ownership.

In the Canadian context, St. Denis and Parker (2009) assess 10 early adopters of LEPs and found that active engagement in LEPs varied considerably among communities, noting that one LEP remained entirely silent about public participation. St. Denis and Parker find that most LEPs included local participation in the form of either focus groups, consultation sessions, open houses, surveys, or workshops. Beyond municipal government involvement, the primary participants were local businesses and residents (2009). Rakshit et al. (2018) note a pronounced gap in analysis of local energy planning in Indigenous communities in Canada. In studying six of the Keewaytinook Okimakanak First Nation communities in northwestern Ontario, they find that most local energy planning is based on "top-down decision-making approaches which lack effective community engagement to design culturally appropriate, community-centric energy plans," which "fail to acknowledge local socio-cultural drivers as indicators of energy planning" (Rakshit et al., 2018, p 17). They argue that LEP incentives programs (such as Ontario's Indigenous Community Energy Plan program) failed to address community capacity issues, leading to an overreliance on consultants, high costs and non-functional reports (Rakshit et al., 2018).

3 Study Context

Canada is the second largest country in the world with a population density mainly along the southern border (Natural Resources Canada, 2005). Per capita, Canada has one of the largest greenhouse gas (GHG) emission profiles in the world (Conference Board of Canada, 2017) and 80% of these emissions come from energy consuming activities (Natural Resources Canada, 2018).The average Canadian annual temperature has warmed by 1.7° over the period of 1948 to 2013and is expected to warm twice as fast as the global average—leaving Canadians particularly vulnerable to the impacts of climate change (Bush et al., 2019). For example, Canada is projected to experience increased precipitation, temperature extremes, water shortages and extreme events such as wildfires (Bush et al., 2019).

Indigenous peoples in Canada—who account for 4.9% of the population (Statistics Canada, 2017)—are particularly vulnerable to the impacts of climate change due to factors such as

remoteness, cold climate, aging infrastructure, and reliance on diesel for electricity and heat (Government of Canada, 2017). Energy poverty is also especially common in Indigenous, northern, and rural communities (McMurtry, 2018), which are disproportionately "off-grid" or "remote" and commonly generate electricity with diesel, which increases energy costs and leads to higher GHG emissions and a greater dependence on imported fuel; there are 170 of these sites in Canada (Government of Canada, 2011). Canada's Indigenous communities, however, are increasingly involved in renewable energy, potentially due to geographic location of renewable projects (Hoicka and MacArthur, 2018).

4 Data and Methods

This research investigates: how are LEPs, through (1) their processes of participation and development and (2) the articulated actions contained within them, relevant to CE? In order to address this question, a dataset of Canadian LEPs was developed, where plans from all Canadian provinces and territories were sought out to be identified and obtained using a variety of publicly available sources that included:

1. Government agencies and/or programs supporting local energy planning: The Indigenous Community Energy Plan Program (IESO, 2018); the Ontario Municipal Energy Plan Program (Government of Ontario, 2018); and Federation of Canadian Municipalities' Partners for Climate Protection (Federation of Canadian Municipalities, 2018). Canada's Indigenous and Northern Affairs ecoENERGY Aboriginal and Northern Communities program (Government of Canada, 2016), from which all listings labelled "community energy plans" and "community energy planning" were included.[1]
2. Secondary lists: Hoicka and McArthur's (2018) community energy plans and projects dataset, from which all listings labelled "plans" were included; Indigenous Renewable Energy Projects in Canada (Lowan-Trudeau, 2016), from which all listings labelled "community energy plan "were included; QUEST's Smart Energy Atlas Hub (QUEST, 2018), where all "plans" with a scale of "Neighbourhood/ Development", "Community-Wide" and "Multiple Communities "were included; and Arctic Energy Alliance (2018) — an organization contracted by the Northwest Territories government to assist with planning—from which all listings were included.

3. Keyword searches: Key-word searches aimed to identify Community Energy and Emissions Plans in British Columbia, due to inaccessible information from the program. The keyword search "Community Energy and Emissions Plan" was used to identify and obtain these plans.

Once plans were obtained, a content analysis was performed, which is defined in Krippendoft's (1980) seminal text as is a research technique for 'making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use' (page 18). Content analysis can be used on all types of written texts, allowing for flexibility for researchers (Bengtsson, 2016) to systematically analyze large volumes of data (Stemler, 2001). Two main variations of content analyses include (1) quantitative, which analyzes the manifest contents of texts (e.g. word frequencies), and (2) qualitative, which analyzes the latent content of texts (i.e. meaning behind texts) (Songsore and Buzzelli, 2017). These categories are not inherently mutually exclusive, however, and may be employed simultaneously as a mixed-method approach (Berg, 2001).

In order to assess each obtained plan for its relevance to CE, a framework was developed based on the review of community energy and local energy planning literature. The framework was then used to assess how the development processes and articulated actions of LEPs (Section 2.3) may be strategically addressing the three identified components of CE (section 2.2): participation, ownership and capacity. Tables 1 and 2 outline the questions asked in the assessment of LEPs.

Insert Table 1

Insert Table 2

Based on the framework in Tables 1 and 2, a mixed-method content analysis of the plans were completed using NVIVO, a computer-assisted qualitative data software program. For each question, data was coded from each individual plan, and types of answers for each question were categorized. The categories for each question, presented in Tables 3 and 4 in the results section, were revealed from the plans themselves and were not pre-defined. The frequency of each category was documented, revealing patterns across LEPs in relation to CE.

5 Results

The following section details results specific to the Canadian context (section 5.1), as well as plan development processes (section 5.2) and actions articulated in plans (section 5.3).

5.1 Local Energy Plans in Canada

The investigation resulted in the identification of 244 plans, and 77 of these were obtained and coded. Of the obtained plans, the publication dates range from 2003 to 2017, and the types of communities represented by an LEP includes municipalities, districts/regional municipalities, and Indigenous communities (see Table 3).

Insert Table 3

The findings reveal considerable variation in the number of plans across provinces and territories, with Ontario (ON), British Columbia (BC), and the Northwest Territories (NT) representing almost all (99%) of identified plans (see Figure 1).

Insert Figure 1

The investigation also reveals a high number of Indigenous communities with LEPs (see Table 1). Of the 244 LEPs identified for this research, 167 were from Indigenous communities, of which only 10 were obtained and assessed. This proportion of identified and obtained plans varied from that of other types of communities: for municipalities, 56 of 65 identified plans were obtained and assessed; and for districts/regions, 11 of 12 identified plans were obtained and assessed. The discrepancy between community types can largely be explained due to the status of identified plans. While the majority of identified municipal (63) and district/regional (11) LEPs were found to be complete, in Indigenous communities, only 22 LEPs were found to be complete, while 91 were under development and the status of 53 was unknown (see Figure 2).

Insert Figure 2

5.2 Plan development processes

The development of LEPs are a process in the development of local energy activities, and the research considered how this might be relevant to CE. This portion of the analysis considered: who participated in the development of the LEP, how they participated, at what stage in the process they participated, and how barriers to their participation were considered and addressed. The results of this assessment are presented in Table 4.

Insert Table 4

The first observation (Q1.1) is that while 78% of the 77 plans stated one or more contributing author, this information was absent from 22% of plans. The most common type of contributing author was a consultant (56%), and community staff/elected officials were the second most common type of author (40%). In terms of what actors were involved in plan development (Q1.2), plans had at least one type of actor and up to eight actors as participants, with 48% of plans

stating the participation of four or more types of actors. Community staff/elected officials were the most common actor involved (81%), and a wide variety of other actors participated—most commonly community members/general public/residents (54%), non-profit organizations (45%), utilities (45%), private businesses (42%) and public-sector representatives (29%). The most common methods for participation (Q1.3) were consultation sessions that could include workshops, presentations and meetings, where it was more common for these sessions to be closed with a particular group of targeted actors (73%) than open to the public (43%). Additionally, the assessment considered at what stage different types of actors participated (Q1.4)—specifically, did participation occur prior to or after the articulation of actions contained in the report? The analysis revealed that there was variation in when different types of actors participated: although all types of actors participated prior to the articulation of actions in 57% of plans, actors participated at different stages in the process in 23% of plans—in all of these cases, the community was consulted after the articulation of actions, often by means of a survey in order to review a draft of the plan. In the remaining 21% of plans, it was unknown at what stage any types of actors participated.

Finally, Q1.5 considered how barriers to participation was addressed through the plan development processes: 6% of LEPs acknowledged specific barriers to community participation,12% stated an intent to overcome barriers in the future, and 14% outlined how education for community members was incorporated within plan development processes.

5.3 Actions articulated within plans

The research also assessed the specific actions articulated in plans for their relevance to CE. This part of the analysis considered how plans discussed (Q2.1) low-carbon energy projects, (Q2.2)models of CE ownership (Q2.3) financial support for broader forms of local ownership (i.e. financing/incentives for homeowners, local businesses, etc.), (Q2.4) use of local assets, (Q2.5) and local skills and knowledge development. These results are presented in Table 5.

Insert Table 5

While almost all plans discussed potential low-carbon energy projects (Q2.1)—99% energy efficiency/conservation and 91% renewable energy—CE ownership models (Q.2.2) were only discussed in 31% of plans. The most common models for CE ownership discussed were energy efficiency/renewable energy projects for community-owned buildings (18%) and local ownership of projects through the establishment of a local energy co-operative (10%), where community members would be able to purchase shares.

Within LEPs, it was found that 52% of plans discussed new or enhancements of existing financial supports of local ownership/control (Q2.3). The most common type of financing options were local improvement charges or revitalization tax exemption bylaws[2]. (26%). Incentives for building-scale renewable energy or energy efficiency projects were discussed in 27%. Other innovative financing mechanisms, such as internal funding mechanisms, environmental revolving funds, green leases or on-bill utility financing, were discussed in 4% of LEPs.

Only 8% of plans discussed the use of local assets (Q2.4), be it local goods or local human resources (e.g. suppliers or manufacturers). While 22% of LEPs discussed potential contribution to local employment, most of these plans did not identify specific measures for ensuring employment gains would be local and very few plans quantified these gains.

A high percentage of plans included actions related to local skills development and education related to energy systems, perception of new systems and/or behavioural change (Q2.5):74% of plans discussed education the residents, which was generally related to behavioural change and strategies for reducing individual energy use. 12% of plans discussed a demonstration project as a strategy to educate the community. 19% of plans discussed education for local leadership. 19% of plans discussed specific education campaigns for youth in the community. 43% of plans discussed enhancement of professional skills/knowledge—generally these were related to strengthening capacity for contractors, developers or other professionals.

6 Discussion

The following section discusses how LEPs are relevant to CE, and how the two analyzed stages of plans (plan development processes and articulated actions) may be strategically addressing the three identified components of CE. The first significant finding is that 99% of identified local energy plans are located in jurisdictions with government programs supporting their development. This variation reflects Faller's (2014) argument that local energy planning may still require top-down involvement, as Canadian provinces and territories without programs encouraging local energy planning have seen considerably less uptake.

6.1 Community Participation

The ideal community energy initiative is one that places a high degree of emphasis on community participation (Walker and Devine-Wright, 2008). Such initiatives engage community members as active participants (St. Denis and Parker, 2009), where community participation results in tangible

policy power (MacArthur, 2016). In the context of local energy planning, LEPs would address community energy through meaningful participatory mechanisms for communities, which means that communities participate at a stage when they are able to influence outcomes—specifically, prior to the articulation of actions. Furthermore, guidelines from key actors in local energy planning such as the U.S Department of Energy, the European Union, or Canadian actors such as QUEST all recommend that stakeholders participate prior to the articulation of actions.

This analysis suggests that the plan development processes did not go far enough to treat community members and residents as active stakeholders. While a wide variety of actors participated (Q1.2), all actors participated prior to the articulation of actions in only 57% of plans (Q1.4). Only 56% of plans engaged members of the general public (Q1.2) and a much narrower range of actor types participated in authorship (Q1.1). Although LEP literature cautions against an undue focus on specifically targeted actors (Ivner, 2009), the most common mechanism employed in planning processes was closed sessions with targeted stakeholders. Additionally, engagement mechanisms employed with community members and residents were generally more in line with Rowe and Frewer's (2000) conceptions of consultation or communication than of participation. Finally, while there exists some concern that the use of consultants will prevent community learning opportunities, shared visions and limit the legitimacy of the plan (Ivner, 2009), consultants were the most common authors of LEPs (56%). In Canadian context, there is also a concern that Indigenous local energy planning has seen an overreliance on consultants for LEPs (Rakshit, 2018). Of relevance to this claim is the finding that all of the 10 assessed Indigenous LEPs were authored by consultants, in contrast with only half in the case of municipalities and districts. The cumulative effect of the findings is that plan development processes did not treat community members and residents as active stakeholders. LEPs could therefore be strengthened by improving attention to participatory processes within plan development.

6.2 Community Ownership

Ownership is seen as a defining feature of CE (Seyfang et al., 2013; McMurtry, 2018), where in the ideal CE initiative, communities exhibit a high degree of control (Seyfang et al., 2013) that challenges traditional energy systems and practices (MacArthur, 2016). In order for LEPs to strategically address community ownership, LEPs would discuss CE ownership models as well as new or enhanced financing mechanisms for the support of community ownership. The findings show that nearly all of the assessed LEPs discuss the development of low-carbon energy projects

(Q2.1), however, only 31% of plans discuss CE ownership models (Q2.2) as they are identified in CE literature, (Hoicka and MacArthur, 2018; McMurtry, 2018). In particular, though co-operatives are emphasized in literature as a meaningful departure from traditional energy models (Klagge and Meister, 2018) with an emphasis on the democratic principles associated with CE (McMurtry, 2018), this model of ownership is rarely discussed. Finally, while 52% of LEPs discuss financial support for some form of local ownership, such supports generally did not support CE ownership models. Rather, the majority of discussion in actions surrounding ownership concerns financial supports (i.e. financing/incentives) enabling homeowners to pursue energy efficiency/renewable energy projects (Q2.3)—a minority LEPs also discussed financial supports for businesses, or failed to specify the targeted actors. In the context of community energy, where inclusivity and the inclusion of marginalized actors is prioritized (MacArthur, 2016), this is a considerable gap. One potentially fruitful avenue might be to see whether the process for LEP development could be successfully used to educate about CE opportunities, as there may be potential for CE advocates to address the participation and authorship process to enhance community ownership options in the articulated actions.

While the findings reveal that local ownership is prioritized over local ownership, financial support for local ownership is present in only half of LEPs (Q2.3). It is unclear why the LEPs fail to consistently address local ownership: it could be due to the lack of wider participation in authorship or more participatory forms of engagement; the author's lack of knowledge about governance and ownership models; or jurisdictional constraints on local communities. It should be noted that regulatory mechanisms and laws that allow for CE are defined by provincial governments, not local communities, which means there is variation in the amount of control they have as a decision-making authority, depending on the amount allocated by their respective province (Tozer, 2013).

6.3 Community Capacity

Finally, the ideal community energy initiatives recognize and address constraints on community members' capacity for participation (Creamer et al., 2017) in order to ensure inclusive practices that incorporate marginalized and non-traditional actors' perspectives (MacArthur, 2016). For LEPs to address CE, LEPs would therefore incorporate inclusive and capacity-building development processes in the development and authorship of plans, and would also identify and address gaps in capacity in the articulated actions. LEPs would prioritize education, where a lack

of understanding of energy issues can act as a barrier to participation (Bird et al., 2013). Through such practices, LEP development processes would address unequal capacity levels of different groups within a community as well as build capacity for the community as a whole (Catney et al., 2014; Creamer et al., 2017).

LEPs fell short of this ideal in development processes through the failure to acknowledge barriers to participation or incorporate education into development processes (Q1.5). This failure to address the capacity of community members is significant and may suggest that communities lacked the capacity for more meaningful participatory processes (e.g. participating as authors or assisting with the articulation of actions). Furthermore, within LEP actions, although 74% of LEPs discussed education for the general public within articulated actions, the majority of plans failed to discuss increased professional skills or new/enhanced post-secondary education opportunities (Q2.5). Between this lack of attention and the failure of many plans to specifically discuss local employment (Q2.4)—as well as the lack of discussion regarding local ownership (that potentially creates a revenue stream)—the findings raise questions regarding the level of feedback from and coordination with community groups representing job creation and local economic development.

7 Conclusion

Local energy plans operate in the same space where CE has the potential to emerge; that is, LEPs and CE overlap in their interest in energy activities as they occur in local communities. As such, LEPs represent a mechanism with the potential to address CE. Considering (1) the benefits commonly associated with CE and (2) the rapid growth of LEPs—both in Canada (QUEST, 2016) and in other international jurisdictions (Neves et al., 2015)—assessing the extent to which LEPs are relevant to CE is an important research question. Namely, this question is critical if we wish to avoid descending into a "local trap," where initiatives are considered to be socially beneficial merely because they are local (Catney et al., 2014).

This assessment shows that LEPs have emerged as mechanism both relevant to CE and capable of strategically addressing its core components—community participation, ownership and capacity. Despite some positive contributions to CE, the findings overall do not appear to reveal LEPs as radically divergent from "closed and institutional" processes or "distant and private" outcomes associated with traditional energy initiatives (Walker and Devine-Wright, 2008). The analysis demonstrates that some LEPs are strategically addressing CE, particularly through several indicators related to participation and community capacity. Most LEPs, however,

fail to meaningfully address CE due to a lack of attention of all three CE components. Strengthening the relevant processes and actions would allow LEPs to better address CE.

If LEPs remain merely *local energy* plans rather than *community energy* plans, where plans fail to incorporate both "open and participatory" processes and "local and collective" outcomes, communities will lose an opportunity for the transformative change widely associated with CE. The investigation suggests that for CE advocates, LEPs may be considered an important space to pursue CE ambitions. However, given that 99% of plans occur in jurisdictions with government programs supporting their development, and that most regulations and programs are enabled by provincial and federal governments, advocacy for supportive policies across multiple levels of governance remains critical.

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Acknowledgments

This research was supported by The Social Sciences and Humanities Research Council of Canada through an Insight Development Grant and a Canada Graduate Scholarship; The Faculty of Environmental Studies at York University; as well as the PowerStream Chair at York University.

Declaration of interest statement

The authors certify that they have no conflict of interest to declare.

Tables

Table 1. Questions assessing LEP development processes

Questions	CE Component addressed	Relevant Literature
Q1.1: Who is listed as an author of the plan?	Participation	Walker and Devine-Wright, 2008; Hoffman et al., 2013; Berka and Creamer, 2018; St. Denis and Parker, 2009; Ivner, 2009
Q1.2: Who participated during plan development?		
Q1.3 How did they participate?		
Q1.4: At what stage did they participate?		
Q1.5: How does the plan discuss potential barriers to their participation?	Capacity	Hoffman and High-Pippert, 2005; MacArthur, 2016; Berka and Creamer, 2018; Catney et al., 2018

Table 2. Questions assessing articulated actions (i.e. expected outcomes) in LEPs

Questions	CE Component addressed	Relevant Literature
Q2.1: How do actions discuss low-carbon energy projects?	Ownership	Walker and Devine-Wright, 2008; Seyfang et al., 2013; McMurtry, 2018; Hoicka and MacArthur, 2018; Berka and Creamer, 2018
Q2.2: How do actions discuss models of CE ownership?		
Q2.3 How do actions discuss new or enhancement of existing opportunities for financial support of community ownership?		
Q2.4: How do actions discuss the use of local assets (i.e. local goods and labour)?	Capacity	Hoffman and High-Pippert, 2005; MacArthur, 2016; Berka and Creamer, 2018; Catney et al., 2018
Q2.5: How do actions discuss local skill and knowledge development?		

Table 3. Identified and obtained plans by community type and province or territory

Province/ Territory	Identified municipal plans	Obtained municipal plans	Identified district/ regional plans	Obtained district/ regional plans	Identified Indigenous plans	Obtained Indigenous plans	Total Identified	Total Obtained
Alberta	5	5	0	0	0	0	5	5
British Columbia	27	25	6	5	37	1	70	31
Manitoba	2	1	1	1	0	0	3	2
New Brunswick	1	1	0	0	0	0	1	1
Newfoundland & Labrador	0	0	0	0	0	0	0	0
Nova Scotia	2	1	2	2	0	0	4	3
Northwest Territories	3	3	0	0	30	9	33	12
Nunavut	0	0	0	0	0	0	0	0
Ontario	21	16	3	3	100	0	124	19
Prince Edward Island	1	1	0	0	0	0	1	1
Quebec	1	1	0	0	0	0	1	1
Saskatchewan	1	1	0	0	0	0	1	1
Yukon	1	1	0	0	0	0	1	1
Total	**65**	**56**	**12**	**11**	**167**	**10**	**244**	**77**

Table 4. Results - Plan Development Processes

Questions	**Types**	**# of LEPs with type**	***% of LEPs with type***	**Scope**
Q1.1: Who contributed as an author for the plan?	Community Members/General Public/Residents	1	*1*	1-6 types of authors per plan
	Community Staff/Elected Officials	25	*32*	
	Consultant/Consulting Firm	43	*56*	
	Nonprofit Organization	9	*12*	
	Public Sector (Education, Health, Police)	2	*3*	
	Private Business	1	*1*	
	Provincial/Territorial Department	1	*1*	
	Utilities	4	*5*	
	Unknown	17	*22*	
Q1.2: Who participated during plan development?	Community Members/General Public/Residents	43	*56*	1-7 types of actors per plan
	Community Staff/Elected Officials	62	*81*	
	Consultant/Consulting Firm	13	*17*	
	Indigenous leaders/Elders*	16	*21*	
	Nonprofit Organization	35	*45*	
	Public Sector (Education, Health, Police)	22	*28*	
	Private Business	32	*42*	
	Provincial/Territorial Department	7	*9*	
	Utilities	35	*45*	
	Unknown	6	*8*	
Q1.3: How did they participate?	Citizen assemblies	2	*3*	1-4 types of methods of participation per plan
	Consultation sessions, open to the public	33	*43*	
	Consultation sessions, not open to the public	56	*73*	
	Newsletters/emails/letters	9	*12*	
	Surveys	15	*19*	
	One-on-one interviews (in person or telephone)	8	*10*	
	Open houses	15	*19*	
	Website/social media	15	*18*	
	Unknown	12	*16*	
Q1.4 At what stage did they participate?	All actors participated prior to the articulation of actions	44	*57*	Mutually exclusive types
	All actors participated after the articulation of actions	0	*0*	
	Actors participated at different stages in the process	18	*23*	
	Unknown	15	*19*	
Q1.5 How does the plan discuss potential barriers to their participation?	Discussed specific barriers to participation	6	*6*	1-3 types of discussion of potential barriers to participation
	Discussed incorporating diverse voices and views	3	*4*	
	Incorporated education within plan development process	11	*14*	
	Stated intent to improve inclusivity in the future	9	*10*	
	No discussion of potential barriers to participation	59	*77*	

Table 5. Results - Actions Articulated within Plan

Questions	**Types**	**# of LEPs with type**	**% of LEPs with type**	**Scope**
Q2.1: How do actions discuss low-carbon energy projects?	Energy efficiency/conservation	76	*99*	1-2 types of projects per plan
	Renewable energy	70	*91*	
	No discussion	1	*1*	
Q2.2: How do actions discuss models of CE ownership?	Bulk purchasing of EE materials/RE by the community	2	*3*	1 type of strategy discussed per plan
	EE/RE projects for community-owned buildings (e.g. community centre)	14	*18*	
	Establishment of a local energy cooperative of RE	8	*10*	
	No discussion	53	*69*	
Q2.3: How do actions discuss financial support of local ownership?	Local Improvement Charges/Revitalization Tax Exemption bylaw	20	*26*	1-3 types of strategies discussed per plan
	New financial incentives for building-scale RE/EE projects	21	*27*	
	Other innovative finance mechanisms	12	*16*	
	No discussion	37	*48*	
Q2.4: How do actions discuss use of local assets and local ownership of assets?	Maximize use of local human resources	6	*8*	1-3 types of strategies discussed per plan
	Maximize use of local goods/materials	3	*4*	
	Plan to boost local employment	17	*22*	
	No discussion	58	*75*	
Q2.5: How do actions discuss local skills development and education related to energy systems, perception of new systems and/or behavioural change?	Demonstration project	9	*12*	1-5 types of strategies discussed per plan
	Education for general public	57	*74*	
	Education for local leadership	15	*19*	
	Education for youth	15	*19*	
	Increase professional skills	33	*43*	
	New/enhanced post-secondary education opportunities	6	*8*	
	No discussion	13	*17*	

Figures

Figure 1. Spread of identified LEPs across Canada

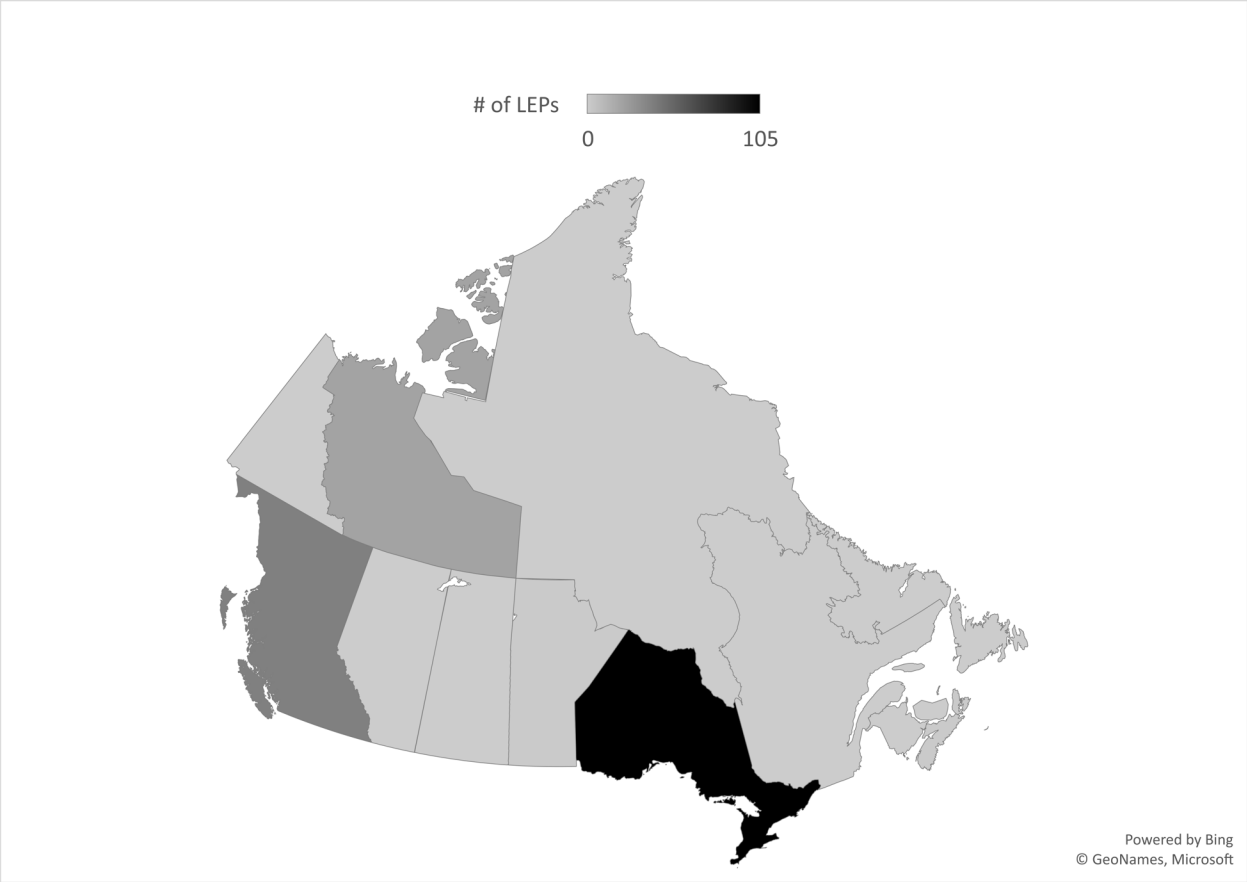

Figure 2. Types of communities and status of plans