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SPECIAL ISSUE — COMMUNITY ENERGY PLANNING IN CANADA:
INSIGHTS AT THE NEXUS OF RESEARCH AND PRACTICE

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ENABLING COMMUNITY ENERGY PLANNING? POLYCENTRICITY, GOVERNANCE FRAMEWORKS, AND COMMUNITY ENERGY PLANNING IN CANADA

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Résumé

Cet article examine les expériences de planification énergétique communautaire (PEC) dans trois provinces canadiennes: la Colombie-Britannique; l'Ontario; et la Nouvelle-Écosse. Les études de cas sont utilisées pour répondre à deux questions: dans quelle mesure les expériences du PEC au Canada reflètent-elles des modèles de gouvernance conventionnels dans lesquels l'autorité est partagée entre différents paliers de gouvernement par rapport à des approches proprement polycentriques; et comment de telles activités polycentriques, autonomes et auto-organisées peuvent-elles réussir sans règles globales favorables venant des plus hauts paliers de gouvernements? Les trois cas démontrent des aspects de la gouvernance polycentrique, toutefois ils les cas mettent en évidence les limites des initiatives de gouvernance polycentrique locale en l'absence de politiques stables et cohérentes venant de paliers supérieurs. Ces résultats soulèvent des implications importantes sur la capacité des initiatives communautaires à fournir des réponses efficaces à des défis mondiaux complexes tels que le changement climatique en l'absence de cadres politiques et de gouvernance globaux favorables.

Mots-clés: planification énergétique communautaire (PEC) , gouvernance polycentrique, politique de changement climatique, Le Canada, L'Ontario, La Colombie-Britannique, La Nouvelle-Écosse

Abstract

This paper focuses on the community energy planning (CEP) experiences within three Canadian provinces: British Columbia; Ontario; and Nova Scotia. The case studies are employed to consider two questions: to what extent do CEP experiences in Canada reflect conventional multilevel governance models in which authority is shared between different levels of government versus more truly polycentric approaches; and can polycentric, autonomous and self-organizing activities succeed without supportive and enabling overarching rules from senior levels of governments? While all three cases demonstrate aspects of polycentric governance, the cases highlight the limitations of local polycentric governance initiatives in the absence of stable and consistent higher-order policies. The findings have significant implications for the ability of distributed bottom-up initiatives to provide effective responses to complex global challenges like climate change in the absence of supportive overarching policy and governance frameworks.

Keywords: community energy planning, polycentric governance, climate change policy, Canada, Ontario, British Columbia, Nova Scotia

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1. INTRODUCTION

Community energy planning, alternatively referred to as local or municipal energy planning, represents “a process to develop strategic vision documents that outline the energy goals of a local context” (Wyse & Hoicka, 2019, p. 1). It is a growing trend both internationally and in Canada (Ivner, 2009; St. Denis & Parker, 2009). As a common component or extension of local climate change mitigation and adaptation planning, Community Energy Plans (CEPs) have gained importance as local governments move to address the impacts of climate change and reduce greenhouse gas (GHG) emissions. CEPs provide a structure to integrate considerations around urban form, transportation, energy sources, buildings, and climate change planning into coherent and integrated community-level strategies. As such CEPs offer substantial potential to advance community and energy sustainability (Jaccard et al., 1997).

CEPs involve complex interactions between local and senior levels of government, publicly and privately-owned utilities, developers, building owners and operators, transportation service providers, community organizations, and individual residents. They may engage with federal and provincial policy frameworks around climate change, energy and land-use in varying ways. These policy frameworks have themselves traditionally been relatively disconnected, particularly around the linkages between energy and land-use planning and urban form.

As a result, the development and implementation of CEPs offers potentially important case studies in the operation of what are *de facto* multi-level governance models in the areas encompassed by CEPs. Research suggests that the divided and territorialized energy systems that operate across different levels of government in Canada can impede CEPs (CEA, QUEST & SP 2016; Tozer, 2013). Focusing on the cases of the Canadian provinces of Ontario, British Columbia and Nova Scotia, studied through the Community Energy Knowledge-Action Partnership (2019) project, the

paper assesses the extent to which higher-order, federal and provincial-level institutional, legislative and regulatory structures enable or function as barriers to CEP development and implementation by local governments. The broader implications of these findings for multilevel, or polycentric, governance models are examined.

1.1 CEP as Multilevel and Polycentric Governance

Multilevel governance, traditionally seen as “a system of continuous negotiation among nested governments at several territorial tiers—supranational, national, regional and local” (Marks, 1993, p. 392), has been characterized as having two distinct types. The first is a more hierarchical view of multilevel governance that focuses on the ways in which authority is shared between different levels of government. The second type is seen as more polycentric — a type of multilevel governance emphasizing the “multiple overlapping and interconnected horizontal spheres of authority” (Bulkeley & Betsill, 2005, p. 48). Polycentricity in this sense suggests something more than just the engagement of multiple levels of government into the governance process.

Ostrom et al. (1961) introduced the concept of polycentricity in their effort to understand whether the delivery of services by public and private agencies to local communities represented the common characterization of a chaotic disarray, or if it was an example of their hypothesis that it was, in fact, a more productive system. They argued that polycentric systems involve “many centers of decision-making which are formally independent of each other,” yet function “in a coherent manner with consistent and predictable patterns of interacting behaviour” (Ostrom et al., 1961, p. 831). Polycentric systems of governance are generally understood to include: multiple levels of governance (local, provincial, national, regional, and global); multiple types of political units (general-purpose, specialized, and cross-jurisdictional); and multi-sectoral organizations (i.e., private, public, voluntary, community, and hybrid types), and to encompass multiple functions (e.g., production, financing, coordination,

monitoring, sanctioning) (Daley et al., 2014; McGinnis, 2011, pp. 171-172). The interacting actors are assumed to have the autonomy to create and enforce rules in a given locale and policy arena (Ostrom 2010; Schoon et al., 2015).

Polycentric perspectives are increasingly seen as essential to the study of local governance (Hooghe & Marks, 2003). Polycentric systems attempt to match governance levels to the scale of the problem and rectify the often-mismatched “fit” between “institutional attributes” and the properties of the system (Schoon et al. 2015). The potential roles of polycentric governance models in responding to climate change have drawn particular attention over the past decade. Bulkeley and Betsill (2005), for instance, stress the importance of stepping beyond the local as a frame of reference when analyzing urban sustainability and engaging with the processes shaping local capacity and political will for sustainability initiatives. They argue that urban governance in the context of climate change involves relations between different levels of government as well as “new network spheres of authority which challenge traditional distinctions between local, national and global environmental politics” (Bulkeley & Betsill, 2005, p. 42). Ostrom (2012) argues that climate change mitigation requires an improved understanding of the strength of polycentric systems, as the global level is too often seen to be the only one capable of addressing the problem of climate change. Others have emphasized in particular the potential contributions of subnational (municipal and state/provincial) climate governance in decarbonization (Bernstein & Hoffman, 2018), and the extent to which initiatives may emerge in an autonomous and self-organizing manner (Newell & Bulkeley, 2017)

Ostrom (2009, 2010) acknowledges the eventual need for international cooperation on climate change, but argues that building a polycentric system acts to spur national and international regimes to take action. Ostrom and others (Daley et al., 2014; Rabe, 2008) point out that this approach is by no means a panacea, but that it works with the current reality of diverse climate governance

experiments occurring in greater abundance at subnational and local scales. Rabe (2008, p. 36) similarly argues that a “mixture of strategies at multiple levels may be the best approach” to deal with the unique complexities of the problem.

While modes of governance have been shifting from more hierarchical/bureaucratic models to more polycentric/networked structures, it is important not to underestimate the power and unique role of the state within modern networked governance systems. State actors are unique in their ability to make and enforce rules, roles which cannot be fulfilled by any combination of non-state actors (Setzer & Nachmany, 2018). To date, the role of the state and overarching rules has been given very little attention within polycentric conceptual frames and mid-level emerging governance theory. The situation has left a key gap in understanding how polycentric governance systems operate in practice (Kaiser, 2020).

The role of state-steering in providing overarching rules has not been a core focus of the development of polycentric governance theory following Ostrom. However, “references to a set of overarching rules are found in almost all definitions of polycentric governance” (Heikkilä & Weible 2018, p. 19; Jordan et al., 2018). Polycentric governance theory posits that higher-order rules set out by the state can aid in regulating and mobilizing other actors in a way that advances effective climate governance (Setzer & Nachmany, 2018). These kinds of overarching rules can take many forms. They are not limited to formal legislative or policy directives. Rather, they can include delegations of authority, financial incentives and support, and even technical assistance needed for local actors to be able to undertake self-initiated, polycentric actions.

The roles of higher-order rules in operationalizing polycentric governance has drawn increasing attention in recent years (see Abbott 2017; Jordan et al. 2018; Mansbridge 2014; Setzer & Nachmany 2018). For example, Setzer and Nachmany (2018) found increased regulation and mobilization provided by domestic governance institutions contributed to enhancing polycentric approaches to

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climate governance. Similarly, Kaiser (2020) found that California's comprehensive subnational climate governance regime, consisting of a high number of rules and regulations, was critical in shaping the behaviour of other actors in a way that allows climate action to move forward. An important corollary may be that polycentric initiatives are difficult or nearly impossible to pursue in the absence of appropriate higher-order rules. If fact, such rules may create implicit or even explicit barriers to such activities.

While there is a growing interest in exploring climate change mitigation strategies through polycentric frameworks, limited attention has been given to the practice of community energy planning in that context. Pitt (2010) investigated plans and policies adopted by 17 municipalities in the United States to reduce energy use and GHG emissions. The study found that more polycentric types of multilevel governance structures and knowledge, which include sharing among governmental and non-governmental actors, were important “keys to success” in climate change mitigation planning at the local level. Bauwens (2017), while not looking specifically at energy planning, considered community-based energy initiatives through a polycentric framework and argued that these initiatives are inspired by a self-organization principle, which is central to the concept of polycentric systems. Community-based initiatives, as parts of larger polycentric systems, may also help to overcome barriers related to public trust and sustainable energy technology diffusion (Bauwens, 2017)

In this context, the Canadian experience with community energy planning offers an important opportunity to explore the potential for polycentric governance approaches to climate change mitigation and adaptation at the local level. The three cases explored in the paper all have potentially strong polycentric characteristics. At the same time, they provide opportunities to examine the role of higher-order rules in both enabling and limiting effective polycentric climate governance. Provincial governments in Canada hold strong jurisdictional

and operational positions around energy services delivery, particularly at the local level. Provinces have near-exclusive jurisdiction over electricity-related matters and exercise regulatory oversight of natural gas and other fuel distribution systems (Doern & Gattinger, 2003). Except on federal and Indigenous lands, provinces hold ultimate control over municipal governance structures and public and private land-use planning. Provinces are therefore in very strong positions to set the overarching rules under which locally or community-initiated energy and climate change planning and plan implementation takes place. Those functions are found to play very strong roles, positively and negatively, in the realization of polycentric governance models in community energy planning in all three cases.

1.2 Research Approach

The paper focuses on the CEP experiences within three Canadian provinces: British Columbia, Ontario, and Nova Scotia. The case studies are employed to consider two questions. The first is to what extent do CEP experiences in Canada reflect conventional multilevel governance models in which authority is shared between different levels of government, or more accurately delegated from the province to local authorities, versus more truly polycentric approaches emphasizing the “multiple overlapping and interconnected horizontal spheres of authority” (Bulkeley & Betsill, 2005, p. 48)?

The second question asks, in the context of the debates over the roles of bottom-up polycentric initiatives versus global and senior (i.e., national, state, or provincial) governmental responses to challenges like climate change, whether CEPs can succeed as polycentric, autonomous, and self-organizing activities without overarching supportive and enabling rules from senior levels of governments? In the alternative, to what extent can such higher-order rules constrain CEP initiatives and similar polycentric activities?

The provincial case studies were developed through the review of primary provincial and local legislation, policies and plans, and secondary

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literatures. Interviews were conducted with current and past officials and other actors at the provincial and local levels, including utilities, non-governmental and community organizations, and planning practitioners. The research also draws on research and workshops conducted as part of the broader CEKAP project.

Each province is examined in terms of the following considerations:

- To what extent have CEPs or similar locally initiated energy or climate change plans been adopted within the province?
- Has the provincial government adopted overarching policies directly related to CEP, such as requirements or incentives for comprehensive municipal energy or climate change plans?
- Do higher order provincial energy or climate change policies make explicit provisions for CEP activities and related initiatives, such as the development of district energy systems, or distributed energy resources (DERs)?¹ Are these activities incorporated into provincial energy or electricity policies and strategies?
- Are there specific energy or climate change-related mandates or references in provincial land-use planning policies that are supportive of or enable CEP development? Do provincial planning policies present potential barriers CEP initiatives?
- Has the federal government played any significant role in CEP development within the province?²

Given the focus on the interactions between different levels and types of governance, the paper

does not investigate the implementation or impact of community energy plans *per se*, as that would require a separate study. Evidence on the implementation and effects of CEPs in Canada is limited. Tozer (2013) assessed a small number of plans in terms of their impact on energy management in municipal operations but not for community-scale initiatives or broader GHG emission reduction plans. Other studies, like St. Denis and Parker (2009) and Wyse and Hoicka (2019), have focused on the content of plans rather than whether or not actions were implemented or their impacts.

2. THE CASE STUDIES

2.1 British Columbia

British Columbia (BC) was the first province to develop a framework for local energy and climate change planning. These directions were established in the late 2000s under the then government of Liberal Premier Gordon Campbell, alongside the introduction of the province's carbon tax. As such, BC provides a case study in the impact of a relatively strong and stable framework of higher-order rules around CEP activities. The case also highlights the potential tensions between those rules in the area of energy policy, and more local, polycentric initiatives.

2.1.1: CEP Policies

The 2008 Local Government (Green Communities) Statutes Amendment Act (Bill 27) established BC's core legislative framework for CEPs by amending two key pieces of legislation: the Community Charter, and the Local Government Act. The Community Charter establishes the legal framework for municipal powers, while the Local Government Act establishes the structure for regional districts, as well as municipal planning and land use authorities.

¹ DERs involve the integration of a range of technologies, including solar photovoltaic, wind power, cogeneration, renewable natural gas, energy storage, and electric vehicles, into stable and reliable energy resources at a local level (ETNO, 2019).

² The federal Gas Tax Fund (GTF) which provides funding support for local infrastructure projects and initiatives, including community energy systems (Infrastructure Canada n.d.) may be particularly significant in this regard.

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Bill 27 required local governments to include targets, policies and actions associated with the reduction of GHG emissions in their Official Community Plans and Regional Growth Strategies. It also amended the land use planning provisions of the Local Government Act specifically to enable their use for GHG reductions and energy conservation. In addition, the legislation granted local governments the ability to embed energy conservation and GHG reduction objectives in development permit areas, and to exempt developers from development cost charges where subdivisions are designed to reduce GHG emissions (Section 559).

The provisions of Bill 27 were intended to enable the signatories of the BC Climate Action Charter (BCCAC) to achieve their Charter commitments. Established in 2007, the BCCAC is a voluntary agreement between local governments, the Union of BC Municipalities (UBCM) and the BC government. Its aims were to reduce GHG emissions, remove policy barriers to climate action, and foster intergovernmental cooperation (Climate Action Toolkit, 2011). The Charter commits signatories to achieving carbon-neutral government operations by 2012, measuring and reporting on their community GHG emission profiles, and adopting smart growth principles (BC, 2007). Ninety-six percent of BC municipalities are signatories to the Charter (Climate Action Toolkit, 2011). Strong financial incentives are provided for Charter participation, including eligibility to receive a grant equal to 100 percent of the carbon tax paid directly in a region via the Climate Action Revenue Incentive Program (CARIP) (BC, 2018b). The funds can support a wide range of municipal actions, including community energy projects and initiatives.

The BCCAC is supported through the Community Energy Emissions Inventory (CEEI), also established in 2007. The CEEI provides local governments with energy use and emissions data. (BC. Ministry of Environment and Climate Change Strategy, n.d.). Further support for CEP activities include the Community-scale Energy and Emissions

Modelling tool. The modelling tool allows communities to assess the impact of future land-use changes by compiling existing modelling tools used by other communities and providing associated case studies (Climate Action Toolkit, 2011).

2.1.2: CEP and Energy Policy

BC Hydro, a provincially-owned utility, serves over 95 percent of all end-use electricity customers in British Columbia. The private utility FortisBC serves the remaining customers, located in the south-central region of the province.

The primary electricity planning framework for BC flows from BC Hydro's five-year Integrated Resource Plans (IRP). The most recent IRP dates from 2013 and makes only very limited references to community-based or local energy initiatives (BC Hydro, 2013). A number of CEP relevant initiatives have emerged in the meantime. The most significant has been the *BC Hydro Sustainable Communities Program* (BCHSCP), which offers municipalities funding and resources to develop community energy and emissions plans and to hire community energy managers for their implementation.

The province's energy policy framework includes other provisions potentially relevant to CEP activities. The BC Energy Step Code, for example, permits municipalities to establish more stringent building energy efficiency standards than the requirements of the BC Building Code. While initially voluntary, in 2017 local governments were given the option to require that builders meet one or more of the steps in the code (Weir, 2018).

BC anticipates a surplus of "clean" electricity from its large hydropower projects, particularly with the 2017 decision to proceed with the 900MW Site C dam project. This has led to a substantial pull-back in investments in energy efficiency, and the curtailment of programs supporting distributed and renewable energy (RE) resource development (BC Chamber of Commerce, 2016; BC Hydro, 2017; Gaede et al., 2019).

The 2018 CleanBC plan commits to developing a new BC Hydro IRP within a wider review of BC

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Hydro's role and approach. Specific references are given to provisions for "adapting to growth in distributed and district energy and new digital technology" (BC, 2018a, pp. 61-62). BC Hydro states that it will file a new IRP with the BC Utilities Commission in 2021 (BC Hydro, 2020).

2.1.3: CEP and Land-Use Policy

There are no direct mandates around CEP and climate change planning in the BC Local Government Act. The legislation establishes the core planning authority of municipalities, and guides their decision-making processes. The Act does contain some provisions that indirectly support CEPs by providing local governments the option to utilize density bonus zoning bylaws (e.g. Section 904 of the Local Government Act; Bell et al., 2010) and Community Amenity Contributions (CAC) (BC. Ministry of Community, Sport and Cultural Development, 2014; City of Vancouver, 2016).

The 2018 Clean BC Plan highlights the "critical" role of local governments in areas such as "developing new clean energy sources, supporting active and cleaner transportation options and helping B.C. transition to zero waste" (BC, 2018a, pp. 56, 60). The plan emphasizes that urban

planning decisions that make communities livable also reduce energy and emission intensity. There are also references transportation demand management (e.g., development focused on along existing transit routes), and strengthening transportation network infrastructure (e.g., increased options for cycling and walking), although specific implementation measures have yet to be developed.

2.1.4. BC Summary

The BC case highlights the potential impacts of a consistent and comprehensive framework of higher-order rules in support of local energy and climate change planning initiatives. Eighty percent of the BC population has been identified as being covered by a CEP (CEA, QUEST & SP, 2016). The provincial level framework has included not only legislative mandates and authority, but also financial incentives, and support with data access and community-level modelling.

At the same time, the BC case also illustrates the potential tensions between overarching policy directions and local activities. BC has committed to a major expansion of its hydro-electric generating capacity through the approval of the Site C dam project. The project is seen as being likely to result

Timeline of British Columbia Legislation Relevant to Community Energy Planning

Figure 1. A timeline of British Columbia legislation and policy actions relevant to community energy planning.

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in a surplus of electricity. This situation has led to a significant erosion of provincial support for energy efficiency and other distributed renewable and community-based energy activities. These are often central elements of community energy plans.

2.2 Ontario

Like BC, Ontario established a relatively substantial suite of climate change policies from the mid-2000s onwards, culminating in the adoption of a comprehensive Climate Change Action Plan in 2016, and implementation of a cap and trade system for GHG emissions in 2017 (Environmental Commissioner of Ontario, 2019). While the 2016 plan was indirectly supportive of CEP activities, unlike BC, the province never established an overarching policy framework for local energy or climate change planning. Rather, activities were left in the hands of individual municipalities with limited direct support from the province or its agencies. What framework had been established was significantly disrupted by the outcome of the 2018 provincial election, which was followed by the dismantling of much of the province's overarching climate change strategy. The Ontario case also illustrates tensions between the direction of higher order energy policy, and more local, polycentric initiatives, similar to those seen in BC.

2.2.1. CEP Policies

Ontario has provided no formal legislative mandates to local governments around energy and climate change planning comparable to BC's Bill 27 (2008). Prior to the 2018 provincial election, a number of programs were established to support energy and climate change planning at the local level. The Ontario Municipal Energy Plan program (MEP), introduced in 2013, provided funding to communities to assist with energy plan development, increase local understanding of energy use, and help identify energy efficiency and clean energy opportunities (Chandhoke, 2016). However, the program was largely limited to energy planning for municipalities' own operations, as opposed to wider, integrative community plans. Eight municipalities have participated in the MEP

program (Ontario, 2020). Its companion, the Indigenous Community Energy Plan program (formerly the Aboriginal Community Energy Plan program) is supported by the province's Independent Electric System Operator (IESO). The program assists First Nations and Métis communities and organizations in developing plans to improve energy efficiency and reduce electricity consumption at the community level. It has had considerably more uptake, with 140 communities participating (IESO, 2020).

The provincial government released a five-year Climate Change Action Plan (CCAP) in 2016 under the auspices of the *Climate Change Mitigation and Low-Carbon Economy Act*. The plan budgeted significant funding for projects to reduce GHG emissions proposed by municipalities. The CCAP referenced the planning and development of low-carbon communities through various actions, including:

- Strengthening climate change policies in the municipal land use planning process, e.g., require electric vehicle charging in surface lots and setting green development standards;
- Supporting municipal and other stakeholder climate action, e.g., supporting community energy planning, mapping and platforms (Ontario, 2016).

Under the CCAP, a Municipal GHG Challenge Fund was to be financed through the province's cap and trade program. Eligible municipalities could receive up to 100 percent of project costs—up to \$2 million per project—for projects leading to emission reductions. To obtain funding, the municipality had to complete a CEP meeting eligibility criteria. (Ontario, 2017a). The program was terminated along with the overall CCAP in 2018.

2.2.2: CEP and Higher Order Energy Policy

Ontario's electricity and energy policies include no explicit provisions or mandates for CEP initiatives. At best, energy policies have from time to time,

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included elements related to electricity and natural gas conservation, combined heat and power, renewable energy, energy storage resource development, and smart grid development that are potentially supportive of CEP activities. Many of these policies, initiated in the early 2000s, were subsequently terminated under the Wynne and Ford governments.

The province's electricity system planning processes have traditionally been focused on large, centralized generating resources, principally nuclear, legacy hydro-electric assets and coal and natural-gas-fired facilities. The 2009 Green Economy and Green Energy Act (a.k.a. the Green Energy Act) and earlier initiatives had facilitated the introduction of substantial new renewable energy resources (e.g. 4500MW wind and 450MW solar PV) into the system. However, these were largely commercial as opposed to municipally or community-led projects. Standard offer programs for combined heat and power projects were also established (MacWhirter & Winfield, 2019).

The province's Independent Electricity System Operator (IESO) launched a series of regional planning exercises in the early 2010s. These initiatives largely responded to a backlash against the exclusion of local governments from the approval process for new renewable energy projects under the *Green Energy Act*. The planning processes were focused on transmission grid and electricity needs at regional levels (IESO, 2019). They made no provision for CEP initiatives or consideration of grid configuration impacts, operations, or energy needs (Winfield, 2016).

Some larger municipally owned electricity, Local Distribution Companies (LDCs) have shown interest in potential roles in creating, managing, or enabling distributed energy resources (DERs) at the local level (Electricity Distributors Association, 2017). DERs, like roof-top solar photovoltaic installations, microgrids and energy storage technologies, could play a significant role in CEP initiatives and the LDCs important parts in CEP development and implementation. However, the future place of LDCs in energy system planning and

operations is uncertain, particularly in the context of the Ford government's March 2019 termination of their role in energy conservation program delivery (Ontario. Ministry of Energy, Northern Development and Mines, 2019). The primary focus of provincial policy under both recent governments has otherwise been the consolidation of LDCs (Mowat Energy, 2016).

The central element of the province's electricity plans, under the Wynne and Ford governments, has been the refurbishment of the Bruce and Darlington nuclear facilities, as well as reducing immediate electricity costs to consumers (MacWhirter & Winfield, 2019). Future procurement of new electricity resources, if needed, is likely to be focused on a capacity market system (IESO, 2019a). Such a model is likely to be dominated by the large (~10,000MW) and relatively underutilized fleet of centralized gas-fired generating facilities mainly constructed between 2005-2018, leaving little room for new resources relevant to CEP activities (Gross, 2019). There are also concerns over the potential "stranding" of large, high capital cost, and long-lived centralized generating assets (i.e., refurbished nuclear), with the flattening of grid-level electricity demand growth since the mid-2000s and potential for further erosion of grid demand (Cameron et al., 2019; Rivard, 2019). Expanded CEP and DER initiatives could be seen as having precisely such impacts, from the perspective of provincial-system actors (Winfield & Gelfant, 2020).

The Ford government's overall approach to electricity and energy policy has been, at best, unhelpful to CEP activities. The *Green Energy Act* was repealed in December 2018, although the feed-in-tariff program under the Act, as well as the CHP standard offer program, had already been effectively terminated by the Wynne government (Winfield & MacWhirter, 2019). The final round of 738 smaller renewable energy projects, which were almost exclusively community, municipality, First Nations or LDC-led, was terminated in July 2018 (The Canadian Press, 2018). The province's framework for electricity conservation was

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dismantled in March 2019 (Ontario. Ministry of Energy, Mines and Northern Development, 2019).

2.2.3: CEP and Land-Use Policy

To the extent that Ontario has provided mandates around community energy and climate change planning they have occurred through the province's land-use planning system. As part of the implementation of the 2016 Climate Change Action Plan amendments were made to the Ontario Municipal Act, S.O. 2001, c. 25 ("Municipal Act") in 2017 permit municipalities to pass bylaws respecting the "economic, social and environmental well-being of the municipality, including respecting climate change" (Section 11). Section 147 of the Act permits municipalities to engage in long-term energy planning, including consideration of energy conservation, climate change, and green energy.

The Ontario Planning Act (1990), R.S.O. c. P13 ("Planning Act") establishes the province's overarching framework for land-use planning by municipal governments. The Act lays out matters of provincial interest, which the minister, municipal councils, local boards, a planning board and the Local Planning Appeals Tribunal (LPAT; formerly the Ontario Municipal Board) must have regard to when carrying out their responsibilities under the Act. The Act was amended in 2017 to include climate change mitigation and adaptation (Section 2s) in the list of provincial interests.

Provincial Policy Statements (PPS; Government of Ontario, 2014) are made under the Planning Act and outline the province-wide vision for land use planning. Planning decisions are required to conform to the PPS. The 2014 PPS introduced references to climate change for the first time. The document included resiliency to the impacts of climate change in its vision for the province's land-use system. It also required that land-use patterns in settlement areas minimize negative impacts to air quality and climate change and promote energy efficiency (Section 1.1.3.2(a); 1.8); that opportunities for the use of renewable energy

systems and alternative energy systems be maximized, (Section 1.8.1(f)); and that planning authorities support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through appropriate land use and development patterns (Section 1.8.1). The 2014 PPS was therefore supportive of energy and climate planning by municipalities but did not mandate the development of specific plans to deal with these issues.

In 2006, under the 2005 *Places to Grow Act*, a growth plan was adopted for the Great Golden Horseshoe (GGH) region. This encompasses the area centred around Toronto from Kitchener-Waterloo in the west, to Peterborough in the east, and from Orillia in the north, to the Niagara region in the south. Planning decisions are required to conform to the Growth Plan. The original GGH Growth Plan made no references to climate change and minimal references to energy issues.

The GGH Growth plan was updated in 2017 as part of the implementation of the 2016 CCAP to recognize the impacts of climate change and included climate change adaptation and mitigation in its vision for the region (Ontario. Ministry of Municipal Affairs and Housing, 2017). The 2017 plan also made strong connections to the government's overall climate change strategy and targets. The 2017 Plan specifically mandated, for the first time, that upper- and single-tier municipalities "develop policies in their official plans to identify actions that will reduce greenhouse gas emissions and address climate change adaptation goals, aligned with other provincial plans and policies for environmental protection" (Section 4.2.10).

The 2017 Growth Plan also encouraged, but did not mandate, GGH municipalities to "develop greenhouse gas inventories for transportation, buildings, waste management and municipal operations; and to establish municipal interim and long-term greenhouse gas emission reduction targets that support provincial targets and reflect consideration of the goal of low-carbon communities and monitor and report on progress

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made towards the achievement of these targets (Section 4.2.10.2). Other provisions of the plan supported energy conservation in existing and planned developments (Section 4.2.9.1b) as well district energy generation, renewable and alternative energy systems and distribution through community, municipal, and regional energy planning processes, and in the development of energy conservation and demand management plans.

The Growth Plan for the GGH was revised by the Ford government in May 2019 (Ontario, Ministry of Municipal Affairs and Housing, 2019a). The changes significantly weakened the plan's provisions related to containing low-density urban development (Novakovic, 2019). The revision removed all references to the previous government's Climate Change Action Plan, strategy and targets, although the other provisions related to energy and climate change were not changed significantly.

2.2.4. The Made-in-Ontario Environment Plan

On November 29, 2018, the Made-in-Ontario Environment Plan (Ontario, 2018) was released as a replacement to the 2016 Climate Change Action Plan and cap and trade system. The plan seeks a 30

percent reduction of the province's GHG emissions relative to 2005 by 2030 — a significant step back from the 37 percent reduction by 2030 relative to a 1990 baseline committed to by the former Liberal government.

The Made-in-Ontario plan refers to a variety of actions that may support or enable local energy planning. These included changing land-use planning rules to take into account climate change considerations, the development of municipal energy and climate change plans, and commitments to take climate change into consideration in government decision-making. There is also a strong emphasis on energy efficiency and conservation. There has been no action to date to actually implement these directions.

2.2.5. Ontario Summary

BC's experience highlights to the importance of overarching rules enabling locally-led polycentric action on CEP and climate change planning. Ontario, on the other hand, provides an illustration of the limitations imposed by incomplete and inconsistent higher-order rules. CEP and local-level climate change planning activities have remained fundamentally locally-initiated and led processes,

Figure 2. A timeline of Ontario legislation and policy actions relevant to CEP.

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with individual municipal staff acting as the lead policy entrepreneurs drawing together the elements required for such activities (e.g., data, stakeholders, links to OPs). Key elements of the higher-order supporting infrastructure around mandates, funding, data access, and analysis and modelling found in BC were never fully established in Ontario. CEP efforts, although becoming more widespread, with as many as 124 initiatives identified (Wyse & Hoicka, 2019), remain fragmented as a result (CEA, QUEST & SP, 2016).

The situation is further complicated by the Ford government's July 2018 termination of the previous government's Climate Change Action Plan and cap and trade program. Those actions removed most of the financial incentives and supports for CEP activities in the province. The new government's December 2018 Made in Ontario Environment Plan makes references to community-led DER development and the need to address the impacts of climate change, but there has been little substantive action to follow-up on those directions. The overall framework within which CEP activities are to occur has been left uncertain at best.

In addition, as in BC, there were potential conflicts between CEP initiatives and the higher-order direction of provincial energy and electricity policy even before the 2018 provincial election. A combination of flat electricity demand growth, a strong commitment to the renewal of large centralized generating assets, particularly the Bruce and Darlington nuclear facilities, and the existence of a large, relatively new and lightly used fleet of gas-fired generating capacity has led to concerns over the potential for these assets to be "stranded" by initiatives that further reduce grid-level demand. The dismantling of potentially significant components of CEP initiatives such as energy efficiency, renewable energy, and combined heat and power development policies has followed. Successful CEP initiatives themselves could fall into the same category of threat to centralized assets. So far, they have not had a large enough impact to prompt a limiting response from the

province. However, if CEP activities were to have a significant impact on grid energy demand, such response would be far from inconceivable.

2.3 Nova Scotia

Unlike the BC and Ontario cases, Nova Scotia has no higher-order rules mandating, enabling, and financially incentivizing the development CEPs. There has been relatively limited uptake of the concept as a result, with only four municipalities actually developing community energy plans (Wyse & Hoicka, 2019), including Halifax and Bridgewater. However, Nova Scotia has experimented with several innovative strategies for advancing local energy initiatives at both the community and household/building scale. The federal government has played a uniquely strong role in encouraging and enabling local energy and climate change planning in the province. Like Ontario and BC, there are significant tensions between the directions of higher-order energy policies, and local, polycentric energy initiatives.

2.3.1 CEP Policies

While Nova Scotia has not specifically mandated community energy plans, the Federal Gas Tax Fund has enabled the development of Municipal Climate Change Action Plans (MCCAPs), which include energy components. The process was first initiated in 2005 when the federal government put forward a New Deal for Cities and Communities, aiming to help municipalities address the challenge of deteriorating infrastructure while advancing a new sustainability agenda.

The new deal facilitated gas tax transfers for communities that produced Integrated Community Sustainability Plans (ICSP). Grant et al. (2016) identified 51 ICSPs in Nova Scotia (representing 100 percent of municipalities). The plans included objectives such as climate change adaptation, water quality protection, protected areas designations, and general greenhouse gas reductions. However,

³ The ICSP framework defines a community energy system as "co-generation or combined heat and power projects."

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although “community energy systems”³ and district heating and cooling projects were eligible project categories within the ICSP framework, such strategies had far less traction than more conventional activities such as paving roads (Grant et al., 2016). Their study notes that all throughout Atlantic Canada, gas tax funded sustainability planning fell short of reaching its potential—planners interviewed in their study expressed little confidence plans would amount to more than a “checklist” of items in exchange for gas tax funding.

The second phase of the fund was implemented in 2011, building on the ICSP framework with the additional requirement that municipalities submit a Municipal Climate Change Action Plan (MCCAP). The requirement was unique to Nova Scotia. The MCCAP template, which municipalities were required to follow, placed a heavy emphasis on climate change adaptation, likely due to the climate hazards already impacting coastal communities (Vogel et al., 2018). A smaller component of the template includes a mandate to outline energy and emission information, and energy goals and actions (Nova Scotia, 2011).

2.3.2 CEP and Higher-Order Energy Policy

Prior to 2007, 90 percent of Nova Scotia’s electricity came from fossil fuels — primarily coal. A major policy shift took place in 2007 through the Environmental Goals and Sustainable Prosperity Act. The Act set goals ensuring the adoption and implementation of a framework supporting a sustainable energy transition and established specific targets: electricity of 18.5 percent renewable energy by 2013; 25 percent by 2015; 40 percent by 2020. In consideration of the 2013 targets, the Department of Energy commissioned a consultation process, resulting in recommendations for a community level feed-in tariff (FIT) for renewable energy.

In response, the 2010 Renewable Electricity Plan provided for a Community Feed-In Tariff (COMFIT) to encourage community-based (e.g., municipal, First Nations, co-operative, university,

community economic development investment fund (CEDIFs) and non-profit group) renewable energy projects by guaranteeing a rate per kilowatt-hour for electricity sold to the grid over a period of 20 years (Nova Scotia. Department of Energy and Mines, 2011). The plan also included an enhanced net metering program to allow independent power producers (individuals, businesses, and community/not-for-profit groups) to connect renewable electricity projects under 1,000KW to the distribution grid through a meter that measures electricity flows in two directions (People, Power, Planet Partnership, 2016).

A major policy shift occurred in 2013 when the province determined that increased domestic renewable generation would no longer be necessary to reach its 2020 targets. Instead, Nova Scotia would import electricity generated by Muskrat Falls, a large hydroelectric project in Newfoundland and Labrador, through the Maritime Link underwater cable (Nova Scotia. Department of Energy and Mines, 2015).

The COMFIT program was cancelled outright (Abreu, 2015). In addition, net metering capacity was reduced from 1,000KW (1MW) to 100KW. The reduction would exclude major projects from communities and organizations such as Mi’kmaq communities, municipalities, and nonprofit organizations, some of which were already in the planning process when the legislative change was made (Ecology Action Centre, 2015).

Efficiency Nova Scotia, a non-profit corporation mandated to deliver energy efficiency services in the province has recently partnered with the provincial government and municipalities to offer the Property Assessed Clean Energy (PACE) program. Under the program, homeowners can finance energy improvements through payments tied to a local improvement charge. (Efficiency Nova Scotia, 2017). Halifax, Lunenburg, Bridgewater, and Richmond have since introduced by-laws enabling the mechanism.

The most recent provincial energy plan, *Our Electricity Future: Nova Scotia’s Electricity Plan*

Timeline of Nova Scotia Legislation Relevant to Community Energy Planning

Figure 3. A timeline of Nova Scotia legislation and policy actions relevant to CEP.

2015-2020 (2015), introduced new measures to encourage independent renewable energy generation. In 2016, the Renewable to Retail program allowed individual homes and businesses to purchase electricity directly from producers. These producers use NSPI's systems to deliver their output but are required to pay tariffs to NSPI (Nova Scotia Power, 2017). The results of the new approach uncertain, but the tariffs have been criticized as a significant barrier to program uptake (Withers, 2016).

In 2017, the provincial government introduced amendments to the Renewable Electricity Regulations. These are intended to establish a Solar Program for Community Buildings, a less expensive alternative to COMFIT. Unlike COMFIT, the program only applies to solar projects (Nova Scotia Department of Energy and Mines, 2011). The largest allowable solar array is 50kW (Nova Scotia, 2017). Under COMFIT small-scale projects could be up to 6MW (Abreu, 2013). Finally, while the program includes non-profits, charities, universities, colleges, and Mi'kmaq bands, it excludes community economic development investment funds and co-operatives. For homeowners, the new SolarHomes program, which provides rebates for solar PV systems, began accepting applications in 2019. The program is funded by the federal government and is administered by Efficiency Nova

Scotia (Efficiency Nova Scotia, 2019). Uptake of the program appears significant, including 71 projects completed or in progress between 2017 and 2019 (Nova Scotia, 2020)

2.3.5 Nova Scotia Summary

Nova Scotia, unlike the BC and Ontario, lacks any significant higher-order rules mandating or enabling CEP activities. While there has been limited CEP uptake, MMCAPs, which include an energy component, have seen considerable growth, reinforced by requirements linked to the federal gas tax transfer program. However, the focus of these plans has been on climate change adaptation rather than mitigation. Nova Scotia has seen significant policy experimentation encouraging community-based energy initiatives. These initiatives (e.g., COMFIT and enhanced net metering program for projects under 1,000KW) emerged through Nova Scotia's efforts to diversify the utility ownership structure and transition from coal to RE.

At the same time, similar to BC and Ontario, conflicts have emerged between local energy initiatives, and the direction of higher-order energy policies. With mounting criticism that small-scale community-based energy was too expensive, the province shifted its focus to the Maritime Link with Newfoundland and Labrador, claiming this would be a more affordable way to reach renewable energy

targets. As a result, local energy policies have since focused more on energy efficiency and building-scale, rather than community-scale, generation, undermining key supports, like the COMFIT program, for CEP initiatives.

3. ANALYSIS AND DISCUSSION

This paper set out to respond to two core questions, the first being around the extent to which CEP initiatives in Canada have reflected a truly polycentric character; and secondly, to what degree were CEP activities polycentric, autonomous and self-organizing versus requiring supportive and enabling overarching rules from senior levels of governments in order to be successful. A subsidiary question arose around the extent to which CEP initiatives and similar local, polycentric activities could be limited by such higher-order rules.

The answers to these questions have significant implications in terms of the ability of these types of more distributed, bottom-up initiatives, to provide effective responses to complex global challenges like climate change. The findings are also significant in terms of the extent to which self-organizing polycentric local initiatives may ultimately be constrained by the inertia of existing higher-order policies and rules if those policies and rules are not themselves altered. The latter issue is relatively unexplored in the polycentric governance literature.

The three case studies explored in the paper give important insights into these questions. The case studies reveal the complexity of locally focused initiatives. The polycentric character of CEP governance is evident in all three provinces. The case studies share an emergent polycentric character in that in all three cases a wide range of local actors have been involved cooperatively in CEP development. This is particularly evident in Ontario and Nova Scotia, where CEP activities have been fundamentally locally driven initiatives that have struggled with shifting provincial directions. BC's framework was also built on municipal initiatives, particularly the 2007 BC Climate Action Charter.

Although in some ways the experience in Ontario has been closest to a truly polycentric character, with locally-led initiatives engaging a wide range of stakeholders – municipalities, utilities, major energy consumers, members of the community – the province's experiences also demonstrate the limits of these initiatives absent a consistent and supportive set of higher-order rules. Ontario's approach to CEP only really began to mature through the 2016 CCAP and 2017 amendments to the Municipal and Planning Acts and revisions to the GGH Growth Plan. Financial support for local-level energy and climate change planning has largely been withdrawn in the aftermath of the 2018 election, although the key legislative and planning policy provisions remain intact for now.

In the result, CEP activities in Ontario have remained ultimately fragmented, with a very one-off character relying the work of individual municipal staff as key policy entrepreneurs. Development of CEPs is increasing slowly, often closely linked to wider climate change planning activities. Nova Scotia's overall approach has also been inconsistent, with no overarching framework for CEP activities, and at times encouraging local level energy development through initiatives like the COMFIT program and then pulling back. True community level CEP efforts have only really emerged in a handful of communities, like Bridgewater and Halifax, and been very much locally initiated efforts.

The BC experience, on the other hand seems to support the arguments of Kaiser (2020) and Setzer and Nachmany (2018) around the importance of higher-order frameworks enabling and supporting polycentric energy planning at the local level. In addition, it supports the assertion that institutional contexts with higher levels of local government autonomy appear to enhance meaningful action at lower government levels, especially when higher-order rules were established to provide 'carrots' and 'sticks' to local and regional governments. BC has been more willing to delegate authority to local governments around CEP-related activities. The structure of the BC Step Code around building

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energy efficiency is a prominent example of such an enabling arrangement. CEP activities in BC are virtually universal among BC municipalities, and reflect some degree of consistency in approach as opposed to the more fragmented model seen in Ontario. The province has had a consistent and supportive approach to CEP activities beginning with Bill 27 in 2008, through to the 2018 Clean BC plan. This has included legislative mandates, as well as financial and technical support for local CEP initiatives.

Consistent with polycentric urban climate governance theory (van der Heijden 2018) the BC experience also demonstrates the impact of trans-local collaborations (i.e. networks facilitating connections). The BC Climate Action Charter, for example, illustrates a trans-local collaboration, around which higher-order rules were established to support, highlighting the complex interplay between overarching rules and bottom-up dynamics in polycentric climate governance systems.

The Federal government's role has been marginal in Ontario and BC, but central to municipal initiatives in Nova Scotia, effectively providing some of the required higher-order supports. Federal gas tax funding has been essential to the development of Municipal Climate Change Action Plans in the province. However, the early ICSP experience also demonstrates that supportive policies are required for the implementation of any associated initiatives.

In all three cases the role of high-order rules as constraints on bottom-up climate and energy initiatives is strongly apparent. Local energy planning initiatives and activities remain poorly integrated with provincial-level energy policies. Instead, in all three provinces, energy policies have moved in the direction of emphasizing the expansion or renewal of large, centralized electricity-generating resources: Site C in BC; nuclear refurbishments in Ontario; and Muskrat Falls and the Maritime Link in Nova Scotia. These directions have emerged as important short and long-term constraints on CEP supportive policies, particularly the retrenchment of initiatives around energy efficiency, and renewable energy and DER

development, all potentially significant components of locally initiated energy and climate change plans. Provincial level energy policies may yet translate into more explicit constraints on local, polycentric initiatives around energy and climate change should they begin to have significant impacts on centralized energy grid demand.

IV. CONCLUSIONS

CEPs offer substantial potential to advance local energy sustainability goals while reducing GHGs emissions and strengthening local resiliency in the face of the impacts of climate change. The actual effectiveness of CEP initiatives in these terms remains to be fully investigated.

The experiences in all three provinces highlight the limitations of distributed polycentric governance models in the absence of stable and consistent enabling and supportive higher-order policies from senior levels of government in advancing CEP initiatives. This underscores the importance of further considering what kind of overarching rules, including rules for delegating authority and building local capacity, are best suited to enhancing existing bottom-up initiatives.

These types of overarching policies should include appropriate enabling legislative and policy frameworks, providing mandates and authority to local governments to engage in local energy and climate change planning, such as those seen in BC, and to a lesser extent Ontario. Authority in areas relevant to CEP initiatives like building code and energy efficiency requirements needs to be delegated to local governments, along the lines of BC's Energy Step Code.

Senior levels of government also need to provide financial supports and incentives for local climate and energy planning activities such as those provided through the BC Climate Action Revenue Incentive Program, the now terminated Ontario Municipal GHG Challenge Fund and the federal Gas Tax Fund in Nova Scotia. Senior government support in terms of data access and modelling capabilities, as seen through the BC Community

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Energy Emissions Inventory, and Energy and Emissions Modelling Tool, also emerge as crucial elements. Finally, structures need to be established to integrate the outcomes of local, polycentric energy and climate change planning initiatives into higher-order energy policies. Those policies themselves need to ensure that they are supportive of such initiatives.

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