**CANADIAN PLANNING
AND POLICY JOURNAL**

**REVUE AMÉNAGEMENT ET
POLITIQUE AU CANADA**

Community Energy Planning in Canada: Insights at the nexus of research and practice

A joint publication of the Canadian Institute of Planners and
the Association of Canadian University Planning Programs.

En collaboration avec l'Institut canadien des urbanistes et
l'Association des programmes universitaires canadiens en urbanisme

Vol. 2021 – Special issue

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

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Publication of this special issue was partially funded by the Social Sciences and Humanities Research Council, The Canadian Institute of Planners, and the Association of Canadian University Planning Programs, but views expressed are the personal views of the author(s).

THE EMERGENCE AND EVOLUTION OF COMMUNITY ENERGY PLANNING IN CANADA: INTRODUCTION TO A SPECIAL ISSUE

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Résumé

La tendance à la décarbonisation dans le système énergétique du Canada stimule l'innovation sociale et technologique rapide dans le secteur de l'énergie. La planification énergétique communautaire est un mouvement social en évolution rapide et une innovation en matière de gouvernance qui vise à minimiser les impacts et à maximiser les avantages de ces changements structurels. Cette brève introduction au numéro spécial donne un aperçu des principes de base, des défis, des possibilités et des questions qui entourent la planification énergétique communautaire au Canada. Les contributions au numéro spécial sont résumées et placées dans le contexte de cette perspective plus large. Les problèmes de recherche futures sont identifiés.

Mots-clés: planification énergétique communautaire, transition énergétique, gestion de transition

Abstract

The push for decarbonization in Canada's energy system is driving rapid social and technological innovation in the energy sector. Community energy planning is a rapidly evolving social movement and governance innovation that aims to minimize the impacts and maximize the benefits of these structural changes. This brief introduction to the special issue provides an overview of core principles, challenges, opportunities, and questions that surround community energy planning in Canada. Contributions to the special issue are summarized and situated in the context of this broader perspective. Issues for future research are identified.

Keywords: community energy planning, energy transition, transition management

THE EMERGENCE AND EVOLUTION OF COMMUNITY ENERGY PLANNING IN CANADA: INTRODUCTION TO A SPECIAL ISSUE

The push for decarbonization in Canada's energy system is driving rapid social and technological innovation in the energy sector. Energy production technologies are increasingly decentralized and

embedded into local landscapes (e.g., rooftop solar, wind turbines, and district heating systems), while energy consumption is increasingly reliant on electricity infrastructure (e.g., electric vehicles; electric heat pumps) and renewable fuels (e.g., biomass-fueled heating systems). This is happening alongside an emerging 'sharing economy', such as ride sharing and bike sharing programs, that will

Canadian Planning and Policy / Aménagement et politique au Canada, Volume 2021, Special issue:
Community Energy Planning in Canada, pages 1-10.

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ISSN 2562-122X

DOI 10.24908/cpp-apc.v2021i2.13934

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result in fundamental change to how, where, and by whom energy is consumed in communities. Furthermore, new financial mechanisms such as property assessed energy retrofits and virtual net metering are raising new possibilities for ownership and benefits-sharing of energy infrastructure.

A community energy plan (CEP) aims to minimize the impacts and maximize the benefits of these structural changes. ‘Community’ in this context has a geographical and a social connotation. That is, community implies a *local focus* and a stronger role in long-term energy planning among local government and local utilities, established through *inclusive processes* and coalition building in which local governments and energy utilities are among a much more diverse network of change agents. Stated differently, a CEP is a socially inclusive process to identify and follow pathways for change in the way energy is produced, distributed, and consumed to meet community priorities for environmental and social sustainability. It sets targets along with clear actions for how a community, working with and through local government, will achieve those targets. Indeed, the social inclusivity of CEP is what distinguishes it from ‘Municipal Energy Plans’ which focus only on municipal corporate energy systems, or ‘Local Energy Plans’ which tend to be technocratic in their design and implementation.

On one hand, community energy planning is a social movement. In some communities, community energy planning began as a coalition of citizens and stakeholders in the community, without formal arrangements with the regulatory system, organized around a common interest to take local action on climate change. In general, these coalitions are more reformative than revolutionary in tone and pursuit – i.e., aiming to orient decision-making structures and processes toward energy technologies and techniques that improve local outcomes. Although many advocates and stakeholders see CEP as a way to facilitate revolutionary change in ownership structures away from privatization and toward socialization (cf. Wyse & Hoicka, 2019). This approach is especially significant in the context of

Indigenous energy planning, as a pathway toward reconciliation. (Hoicka et al., 2021) On the other hand, CEP is also a governance innovation towards climate change mitigation of the sort espoused by Bernstein and Hoffmann (2018) to the extent that it: (a) works beyond national commitments, by devolving authority and resources to sub-provincial actors who can tailor solutions to specific contexts; and (b) formalizes arrangements (commitments, collaborations) across multiple loci of climate action/actors. In addition, CEP itself becomes a pathway for innovation, to the extent that decentralized approaches allow for some policy entrepreneurship and experimentation (Bernstein & Hoffman, 2018; see also Sengers et al., 2019).

The technical and policy principles of community energy planning are at least three decades in the making (e.g., Jaccard et al., 1997; Getting to Implementation [GTI], 2016; Wene et al., 1988). According to the latest estimates, more than 180 communities representing more than 50% of Canada’s population have a community energy plan of one form or another (GTI, 2016). CEPs vary widely across Canada, due to provincial and community-level differences in institutional capacity, political priorities, community values, and comparative advantages. In its simplest form, a CEP focuses almost exclusively on downstream, demand-side activities such as building retrofits, public transit, or district thermal energy systems (see Pitt & Bassett, 2013). At its most complex, a CEP builds from conservation and efficiency (as the ‘first fuel’) to also consider local distribution and local energy supply, and aims toward structural social changes that enable locally owned generation and distribution (Hoicka & MacArthur, 2018; St. Denis & Parker, 2009; Wyse and Hoicka, 2019). These differences aside, in all cases a CEP documents a community’s vision for how it can leverage and facilitate structural changes in energy systems to achieve broader social and environmental objectives.

The purpose of this special issue is to provide a focal point for dialogue and research related to community energy planning in Canada and abroad.

The work contained in the special issue represents the culmination of a Partnership Development Grant from the Social Sciences and Humanities Research Council of Canada which was used to establish the Community Energy Knowledge-Action Partnership; a group of academics and practitioners with a shared interest in CEP (www.cekap.ca). Collectively, contributions to the special issue engage with issues that have been identified by academics and sustainability planning practitioners as critical to advancing thought and practice in CEP, including:

- The role of local government in CEPs;
- Governance and policy frameworks that enable (or disable) CEPs;
- How CEPs can integrate with prevailing planning domains such as land-use and transportation;
- Techniques for community and stakeholder engagement;
- Energy-economy dynamics associated with the localization of energy infrastructure and energy planning.

This brief introduction will unfold in three parts: an overview of core principles, challenges, opportunities, and questions that surround CEP in Canada; a summary of the contributions contained in the special issue; and, reflections on the next steps for researchers and practitioners. We note the omission of Indigenous community energy plans in the special issue - a topic that was beyond the scope of our collective work. We direct the reader to Hoicka et al. (2021) as a starting point for understanding the unique dynamics and opportunities in Indigenous community energy planning.

COMMUNITY ENERGY PLANNING AS A TALE OF TWO TRANSFORMATIVE ACTS

As a governance innovation, CEP represents a two-dimensional transformation in the way energy planning unfolds across the Canadian political landscape. The first transformative act is about vertical integration and a spatial/administrative decentralization of planning: i.e., bringing a local lens to the process of energy planning and

leveraging the mandate of local government to realize structural change in energy systems (cf. Bernstein & Hoffmann, 2018; see also Dowling et al., 2014). In the decades of pursuing large-scale centralized energy systems such as hydroelectricity and coal or nuclear-power, and the development of regional natural gas utilities, local governments were only tangentially or incidentally involved in energy planning exercises. Mostly, their role was to facilitate development in ways that maximized efficiency of energy distribution and consumption of these centralized and predominantly fossil-fuel based systems. Decentralized energy technologies and market opportunities, however, are bearing upon communities in ways that provincial-level regulators and institutions are ill-equipped to manage on their own. Municipalities and communities can achieve objectives that provincial and federal governments alone cannot. A local lens means that local comparative advantages are more likely to be leveraged while unique local risks are more likely to be mitigated. Furthermore, local governments have more direct contact with the energy users and distribution entities that must adapt to a changing energy sector. All of this implies that a stronger role for local governments and local utilities in energy planning, especially in jurisdictions that have very centralized energy planning processes (e.g., Ontario), will bring more effective institutional fit (Dale et al., 2018; Dowling et al., 2014).

Indeed, CEPs are nested within a multi-scalar and interdependent system of energy institutions and infrastructure. Jurisdiction over key components of energy systems, such as energy generation and distribution infrastructure, is divided across levels of government. This multi-level governance context opens and closes (enables and disables) opportunities for the implementation of CEPs. Furthermore, infrastructure systems and energy markets operate outside of the control of any single community. The CEP process is as an opportunity to explore ways to leverage, enhance and/or overcome limits in the municipal sphere of influence.

The second transformative act is about horizontal integration and represents an exercise of collaborative governance – i.e., management by a combination of government and non-governmental actors. In large part, early principles of CEP were established around the assumption that community energy plans would be led directly by local governments. That view is shifting, and CEPs are now understood as a more inclusive planning process that is opened to the public, community organizations, and business entities. A collaborative governance approach increases community buy-in and brings community resources into the planning process; in other words, it is about capacity building. This second transformative act is what separates *community* energy planning from *local* or *municipal* energy planning. To paraphrase leading practitioners from the City of London, this transformation means that a community energy plan is not local government's plan for the community, but the community's plan for the local government to support. This networked governance approach enables forms of comprehensive planning approaches that are strongly endorsed by leading organizations (e.g., Church & Natural Resources Canada, 2007; GTI, 2016; United States Department of Energy, 2013) for their ability to enable creative forms of system integration that have higher potential to achieve energy and emissions targets and ensure long-term community benefit (Garforth, 2009; St. Denis & Parker, 2009; Tozer, 2012).

COMMUNITY ENERGY PLANNING AS TRANSITION MANAGEMENT

In general, the goal of a CEP is to identify, understand and manage disruptive changes in energy systems for long-term community benefit. Framing CEPs in this way requires a shift in focus *from innovation systems*, where the gaze is centered around the core functions of specific innovation networks or technologies and their ability to promote greener goods and services, *to system innovation*, where the gaze is broadened to consider interdependence across the institutions and infrastructures that constitute the fabric of society

and the way we produce, distribute, and use energy. To address these challenges, many of the leading municipalities in Europe have adopted and adapted the 'transition management' approach (e.g., Frantzeskaki et al., 2012; Loorbach & Rotmans, 2010).

The transition management approach has three features. First and foremost, it is rooted in a conceptualization of energy systems as 'sociotechnical,' where the 'social' and the 'technical' are not seen as discrete dimensions, but as co-productive and inseparable. In other words, energy infrastructure is seen as a material expression of (dominant) value systems and have embedded within them vested interests and regulatory supports. At the same time, social and institutional systems are understood to be shaped by and co-dependent on their material fabric. From this view, technology transitions are not merely the result of economically rational or self-organizing processes. Instead, they are inherently political projects reshaping social practices, institutions and networks (Hewitt et al, 2019).

Second, planning objectives are cultivated within a 'transition arena.' A transition arena is a space in which bold, forward looking, and potentially controversial ideas can be shared outside of the context of formal decision-making processes and its politics. 'Transition arenas' usually take the form of community advisory committees or task forces which advise or directly develop CEPs (but do not have direct decision-making authority). This practice has been implemented across Canada (GIT, 2016) as well as leading jurisdictions across the U.S. (Holscher et al., 2019; Pitt & Bassett, 2011), Europe (Frantzeskaki & Rok, 2018; Loorbach & Rotmans, 2010) and Asia (Mah, 2019). These transition arenas bring many of the key change agents into the room (e.g., key decision-makers from government, energy utilities, community influencers) to engage in dialogue, to negotiate visions, roles, and responsibilities, and to act as 'channel partners' to the broader community (Frantzeskaki et al., 2016).

Third, the transition management approach unfolds in a series of planning exercises that move from strategic to operational activities, including evaluation and reformulation. Planning exercises begin with a long view, centering on visions and goals which define the alternative futures that are desired by the community. Tactical level conversations focus on activities at the level of subsystems that attempt to build up and break-down system structures (institutions, regulation, physical infrastructures, financial infrastructures and so on). Without being framed in the context of long-term strategic objectives, those tactical level conversations can be incoherent and inconsistent (Wittmayer & Loorbach, 2016). Furthermore, framing tactical level conversations within a broader strategic vision helps to ensure more creative solutions that are not limited by existing institutional or infrastructural confines. From these tactical conversations, operational priorities can be delineated, specific roles and responsibilities can be defined, and performance indicators can be identified for evaluation and reformulation, as necessary.

A MODEL FOR COMMUNITY ENERGY PLANNING

Building on these evolutions and insights, we define community energy planning as a process to identify and follow pathways for change in the way energy is produced, distributed, and consumed to meet community priorities. The process brings together technical data and community values to help mobilize individuals and institutions. A networked governance approach is leveraged to identify locally relevant and integrated solutions, and to identify opportunities to share responsibilities and resources toward their realization. CEP includes two broad dimensions. First, a strategic plan which provides a focal point for dialogue across municipal, business, and citizen interests about what the future energy system might look like, its role in society, and key performance indicators of positive progress toward this vision. Second, an implementation plan which identifies near-term objectives along with the roles, responsibilities, and resources that are necessary to realize those objectives. Three principle sets emerge from this definition, as visualized in Figure 1 and summarized in Table 1 on the next page.

Figure 1. Community energy planning principles.

Table 1. Description of community energy planning principles.

Principle Set	Principle	Example
<u>Municipal Lens</u>	Leadership from local government	<p>Commitment to a comprehensive approach to local government, beyond a narrow focus on ‘potholes and parking’</p> <p>Dedicated municipal staff and resources with a mandate to facilitate community-wide energy initiatives (e.g., by-law changes; supporting feasibility studies), not only corporate energy management</p> <p>Leveraging corporate assets and financing power to implement new system designs and technologies in the community</p>
	Leverage institutional mandates and spheres of influence	<p>Focus on initiatives consistent with existing sphere of influence held by local government and community actors</p> <p>Ensure local initiatives are nested within regional, provincial, and federal initiatives to take advantage of learning and program funding</p>
	Establish strategic relationships to expand sphere of influence	<p>Explore synergies with other municipalities to plan regional infrastructure, especially within common commuter-sheds or within the service area of the same energy utility</p> <p>Lobby provincial and federal government to expand municipal sphere of influence where/when appropriate</p>
	Develop robust local decision-support systems	<p>Inventory local data and develop data collection and sharing protocols</p> <p>Adopt reporting protocols espoused by federal or provincial organizations (e.g., the Emissions Analysis Protocol developed by the Federation of Canadian Municipalities) to align with other orders of government</p>
<u>Integration</u>	Embed energy planning into the urban and regional planning system	<p>Integrate energy plans into official municipal master plans and other strategic plans</p> <p>Cross-fertilize energy plans with land-use planning, infrastructure development, transportation, waste management, economic development, and other local-level planning domains and activities</p>
<u>Collaboration</u>	Establish a ‘transition arena’	<p>Develop an advisory committee or a task force that has a relatively long-term tenure and clear terms of reference, with a mandate to consider bold but realistic solutions</p>
	Develop a community engagement plan	<p>Ensure ongoing, meaningful consultation with the public to identify values that will guide technical activities</p> <p>Establish working relationships with key change-agents and social networks</p> <p>Structure community and stakeholder engagement as applied research to yield clear directions and ideas from the community</p>

CONTRIBUTIONS TO THE SPECIAL ISSUE

Contributions to the special issue connect with a wide range of themes and principles described above.

Murphy et al. show how advanced and down-scaled energy-economy models can be used to better understand the capacity of municipal governments to meet their increasingly ambitious energy and greenhouse gas reductions targets. According to their model simulations, municipal governments in their case studies do not have the jurisdictional authority to achieve their targets using policies that are politically acceptable. A survey of energy practitioners indicates that, generally speaking, municipal governments do not have at their disposal the technical resources required to assess the effectiveness of the available policy options. They discuss the implications of these findings for municipal policy design and the coordination of efforts across different orders of government.

Winfield et al. pick up on the theme of coordination of efforts across different orders of government. They start from the observation that locally developed community energy plans can interact with federal and provincial policy frameworks around climate change, energy, and land-use in many ways. As a result, the development and implementation of community energy plans offers a potentially important case study in the operation of what are 'de facto' multi-level governance models in the areas encompassed by CEPs. Their work shows that most provinces have no formal policy frameworks around CEP development and implementation. The paper concludes that among the case studies, British Columbia has established a relatively supportive provincial level policy framework for locally led CEP activities and that the frameworks in other provinces are relatively less developed. In fact, CEP emerges as a largely locally initiated and led activity in those jurisdictions. It remains poorly integrated with or supported by provincial level energy, climate change, and land-use policy frameworks. The paper will assist policymakers in establishing governance and regulatory structures that support local level CEP

development and implementation, while advancing climate change mitigation and adaptation, and more sustainable urban development patterns.

Walter et al. turn our attention to intra-municipal coordination. They argue that municipal energy planning is inherently interdisciplinary, cutting across all facets of municipal operations, and must also involve community stakeholders to deliver key services such as social welfare and environmental protections. With this in mind, their work identifies "points of contact" across municipal units and community stakeholder groups, where aligning visions and action plans could assist all parties in resolving conflicts and leveraging synergies and, in turn, lead to more effective energy planning. They present to us the "Crosswalk" document: a framework that has been developed to assist municipal planners and stakeholder groups in the process of identifying those points of contact. Starting with a series of established principles of effective climate planning, the "Crosswalk" document is designed for use as stakeholder discussion platform and as a central "information hub" where stakeholders can access and review information between meetings. Their work implements the crosswalk document in a case study municipality and reflects on lessons learned.

Fuller et al. study social and municipal influences on electric vehicle (EV) or plugin hybrid electric vehicle (PHEV) purchases. This is an example of community engagement as applied research in a way that also yields important insights into the factors driving EV uptake. They note that while existing research on EV and PHEV purchasing focuses mainly on market-level economic models, few studies investigate how either social influence or municipal intervention impact electric vehicle purchasing behaviour. In an effort to fill this gap, they use a survey of 257 citizens from London, Ontario, randomly selected from four different postal codes, to determine if their likelihood to purchase an EV or PHEV is influenced by social (e.g. talking with family and friends) and/or municipal factors (e.g., municipally sponsored test drive events, preferential parking). Those factors

were included in a model with several other predictors of electric vehicle purchasing behaviour including: cost/financial concerns, environmental concerns, and sociodemographic factors. As hypothesized, both social and municipal variables were significantly associated with likelihood to purchase a PHEV or EV. The implications on these findings are twofold: first, those interested in promoting PHEV or EV should consider messaging that centers on current owners of PHEV or EV interacting with family and friends; second, cities should consider their role in providing relatively low-cost incentives and promotion for PHEV or EV.

Finally, Jahns and Calvert showcase their work on participatory mapping as a way to improve procedural justice in renewable energy planning and implementation. Indeed, the implementation of renewable energy (RE) systems brings stark changes to local landscapes; e.g., wind turbines dotting a rural landscape, or solar panels covering fertile land that previously supplied food. These changes can evoke strong social opposition even among people who are generally supportive of RE and introduce a new set of tensions across urban and rural communities. Research suggests that public tensions around renewable energy development is reduced through inclusive decision-making processes. Their work develops and tests a process for proactive and inclusive spatial planning for RE development in a case study region. They combine participatory mapping and survey-based sentiment analysis in order to understand community concerns around renewable energy projects, and how those concerns are reflected spatially. From a research perspective, the work helps to unpack what regions and what kinds of landscapes community members might find acceptable or not for new renewable energy development. From a planning perspective, the process facilitates dialogue about opportunities and potential impacts with the general public, key stakeholders, and influencers (utilities, land-owners, developers, and municipal staff) in the locality.

FUTURE RESEARCH DIRECTIONS

The research program guiding the work described above builds from the principles of ‘community engaged scholarship.’ In this model, research agendas and outcomes are co-created between the academic and the non-academic community. Through ongoing discussions with sustainability practitioners, we identified two interrelated challenges that serve as a foundation for an effective research strategy. First, aligning institutions, regulations, and planning domains across federal-provincial-municipal orders of government (e.g., identifying the scale at which energy transitions are best managed; ensuring that devolved responsibilities are matched with devolved powers and resources). Second, enhancing local capacity (e.g., through innovative social enterprises, public-private partnerships, and municipal planning systems). From these two broad challenges, a handful of key research themes have been identified (see Figure 2).

Figure 2. Research challenges and themes emerging from ongoing discussions with sustainability practitioners.

These research themes will hopefully rise to the challenge of strengthening the capacity of local governments, local utility companies, and communities undertaking energy transition management and climate change mitigation. At the same time, there is a need to ensure that prevailing

The emergence and evolution of community energy planning in Canada

governance priorities within communities, especially those related to marginalized and vulnerable communities – e.g., housing and energy affordability, homelessness, mental health, and addiction – are also addressed. Indeed, local governments struggle to understand how energy transition management relates to their core mandate. As such, research into CEP and local energy more generally, needs to build more directly from concepts and techniques in local social and environmental justice, community-based natural resource management, and asset management, among others, in order to identify and articulate the connections between energy transition management and community development.

ACKNOWLEDGMENTS

The authors would like to acknowledge the enthusiastic support for this work from the Toronto and Region Conservation Authority, Ontario Climate Consortium, and all our partners from municipalities, provincial government, and civil society across Canada. This work received funding from the Social Sciences and Humanities Research Council Partnership Development Program (890-2015-0008)

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