

COMMUNITY ENERGY PLANNING

A Guide for Communities

Volume 1 - Introduction



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Executive Summary

A Community Energy Plan is a method of evaluating land use and community design options for the more efficient use of energy. Since the use of energy is embedded in every community project, planning for energy and resource use helps the community achieve long-term sustainability.

The impact of energy use within a community extends beyond the consumption of energy to include the effect of spatial design and permanent infrastructure within the built environment. Therefore the Community Energy Plan considers the use of energy as the critical currency for the planning process, driving decision making towards the goal of a reduced energy footprint.

The purpose of the plan is to promote long-term community sustainability. The Community Energy Plan is used as a planning tool to compliment the legislative authority under the Official Plan. By following the regulations set out in the Official Plan, the Community Energy Plan can help communities choose and schedule the type of development that will lead the community towards its end goal.

The Community Energy Planning Methodology is a guide to help communities develop their own Community Energy Plan. This methodology is structured in the form of several volumes that are intended to aid communities in the development of their own long-term strategy. These include:

Volume 1 discusses the concept of Community Energy Planning and its relationship with existing planning processes. This section also discusses the idea of sustainability and how it is applicable at the community level.

Volume 2 details a step-by-step process for developing a Community Energy Plan, allowing communities to educate themselves with the process and thereby achieve a greater level of community buy-in. The support of the community at large is essential for any community plan to be successful.

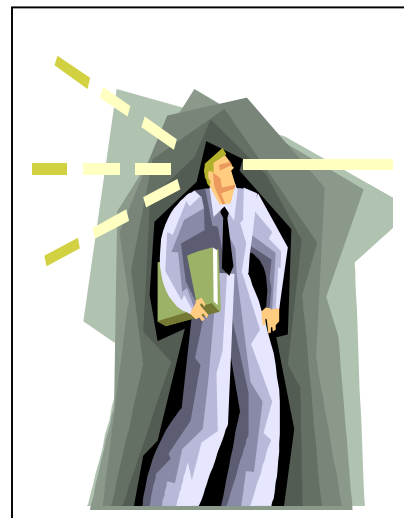
Volume 3 contains ideas and examples of initiatives that have been undertaken throughout Canada and the world, focusing on the reduction of energy and greenhouse gas emissions. They can be used to form the basis for further programs and projects.

Introduction

Non-renewable resources are energy sources not able to be replaced over a period of time within their current rate of exploitation. Therefore, it stands to reason that supplies of non-renewable resources are exhaustible and eventually will run out. In 2003, Non-renewable resources accounted for approximately 70% of the World's total energy supply. According to the recent article, *Energy Resources and Global Development*, published in *Science* (2003), if we continue to consume non-renewable resources at our current rate, supplies will run out in about a half-century from now¹.

In 2004, Canada drew 83% of its energy needs from non-renewable resources: 39% from natural gas, 32% from crude oil, and 12% from oil. Only 8% was obtained from hydro, 4% from biomass, and the remaining 5% from other renewable sources². As non-renewable resources continue to be depleted, Canada's heavy dependence on this sector cannot sustain our and our international market's growing energy needs into the long term. Clearly, there needs to be a progressive transition away from our high dependence on non-renewables to a stronger use of renewable energy resources and a greater efficiency in design and new technologies for energy systems. The Community Energy Planning Methodology is a planning tool to help communities plan for the transitions towards a more sustainable system of energy use.

In this volume, key concepts and definitions surrounding the development of a Community Energy Plan will be explored. Case studies and examples of practical experience are provided throughout the volume, as well as descriptions of additional information sources and tools that may be applied to the planning process.



¹ Chow et al, *Energy Resources and Global Development*

² Pape-salmon, Andrew, *Canada's Energy Economy – the consumer accountability gap*

Chapter 1: The Community Energy Plan

A Community Energy Plan (CEP) is a method of evaluating land use and community design options for the more efficient use of energy. Since the use of energy will be embedded in every community project, planning for energy and resource use can help communities achieve long-term sustainability.

The CEP does not replace existing legislation. It is unofficial; it carries no legal authority. Instead, it is a voluntary planning tool complementary to those already in use.

The development of the plan follows a long-term approach. The goal of this approach is to lead the community towards a sustainable future. What that future looks like, and how it will be reached, is decided by the community, during the planning process.

What is a Community?

A ‘community’ can take many forms, but for the sake of this guide it is considered to be a group of bodies that act together and contain a common theme. Thus, a community may be as large as a city; it may be as small as a neighbourhood, or it may be a region that embraces several local areas of population.

A community is any area or group with common interests that engages its members. A community is where we eat, sleep, shop, go to school, go to work, enjoy the outdoors, and get together for mutual activities: it’s where we live.

When discussing the impact on the community, we talk of the impact on the citizens and all social, environmental, and economic aspects of their lives. When we talk of community wealth, we talk of the wealth embedded within the area and of the people themselves.



Picture from: Vancouver’s Citizen Group

Who can use the Community Energy Planning Methodology?

- ❑ Municipal officials and city planners
- ❑ Consultants (often local groups)
- ❑ Development and utility professionals
- ❑ Local grassroots and community groups
- ❑ The general public, school groups, individuals
- ❑ Etc

Any member of the community may start the planning process. These members may then choose to form a planning committee.

Where can the Community Energy Planning Methodology be used?

- ❑ Villages
- ❑ Towns
- ❑ Cities
- ❑ Regional districts
- ❑ Etc

A CEP can be integrated into the planning process of any area with diverse interests and needs. It can either be part of an Official Plan or it can be part of the development strategy for a regional body.

When can the Community Energy Planning Methodology be used?

- Projects are developed to address actions, such as:
- ❑ Addressing an issue, fixing a problem
 - ❑ Retrofit
 - ❑ Maintenance and replacement
 - ❑ Etc

Communities face many challenges in their ‘day-to-day’ operation. Such challenges may include urban development to accommodate both new growth and preserve existing neighbourhoods; rising costs of operation, uncertainty over financial futures and stagnant economies; increasing demand for public infrastructure and services; and challenges over reducing greenhouse gas emissions in order to meet Canada’s commitment to the Kyoto Protocol³. The Community Energy Plan is used to develop projects to combat these challenges.

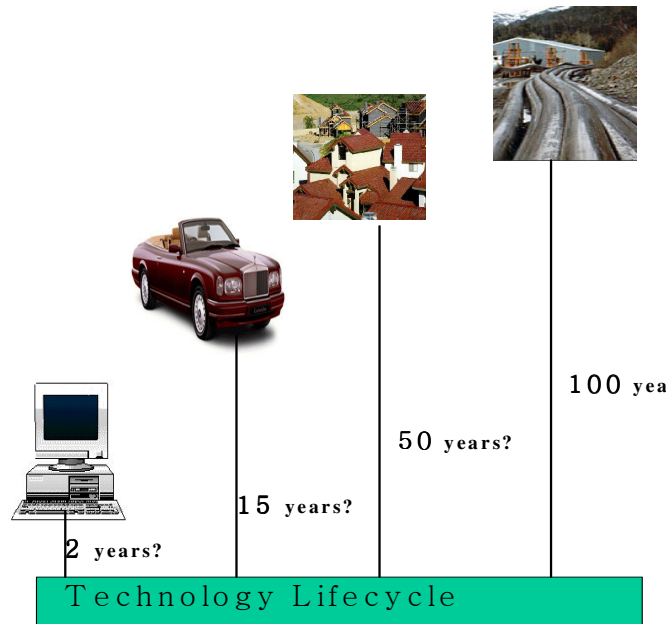
³ Community Energy Association, *Toolkit for Community Energy Planning*

How Do Community Energy Plans Work?

The goal of community energy planning is to design for energy efficiency in community systems as a tool for achieving long-term sustainability. Community energy plans select land use and community design options based on their ability to make the most efficient use of energy. For example, mixed-use development patterns can reduce energy demand by up to 20% while innovative neighborhood layout and orientation techniques can save up to 25% of energy use over traditional practices⁴.

To develop the plan, a team is needed. The team is a partnership between the many community stakeholders, such as: individual citizens, citizen groups, local and regional businesses, elected officials, and municipal staff, such as planners and engineers. The CEP is a collaborative effort, where all parties need to contribute to the direction and goals of the plan. At first, gaining consensus between so many parties, each with their own needs and wants, may seem like a daunting task. However, it is through this collaboration, coupled with community outreach, that an extensive and comprehensive CEP can be created that will benefit the community as a whole over the long term.

The timeframe for the plan is long-term and exceeds that of other regulated plans. Some timeframes reach 60, 80, or even 100 years and encompass the impact of social, environmental, and economic changes caused by growth. Others reach 10 or 20 years into the future. Scheduling for a long-term time frame will allow the planning team to facilitate the orderly replacement of infrastructure with new technologies and more efficient designs as they become available and economically feasible. Present day infrastructure has a lifetime exceeding 50 years, commercial buildings can last 50 years, and public transit rolling stock is expected to last more than twenty years.



Planning timeframes that reflect sustainability must therefore relate to infrastructure lifecycles so as to allow changes in thinking and technology to be incorporated over time. Long-term scheduling also allows the community to plan for long-term contingencies, energy security, community expansion or economic downturn, and even the impact of climate change or environmental degradation.

⁴ Community Energy Association, *Toolkit for Community Energy Planning*

Why create a Community Energy Plan

When one considers the level of effort that is required for the development of any plan, “why do it?” becomes a very real question, and one that deserves a sound answer.

In many communities, managing the operation of the community involves more than simply providing the “legal minimum” of service⁵. For example, one need only look to a ‘one horse town’ community to see the reduction in community wealth when the main industry is shut down. While local governments cannot predict such changes, they nevertheless have the responsibility to plan for such eventualities. Using a CEP to plan for sustainability means adopting mechanisms that will help the community adapt to changes and minimize the impact to the wealth of the community.

The benefit of adopting a CEP to complement other planning tools is that designing for energy efficiency can increase a community’s Quality of Life by focusing on efficient use of local and/or sustainable energy systems that lower the Cost of Living.

In summary, the benefits of a CEP are:

- Environmental protection
- Enhanced quality of life
- Investment into the community and local employment opportunities

⁵ In this document the term “local government” will be used to imply all forms of civil authority that oversees the planning area. These may include for example: local councils, aboriginal band councils, provincial government, designated town managers, and others.

Case Study: In Halton, the region that includes Oakville, the health costs of air pollution in 2000 were a staggering \$290 million, including \$18 million in costs to the health care system. The human cost was 55 premature deaths, 400 hospital admissions and 1,425 emergency room visits. During the 1990s, studies showed that Oakville consistently experienced longer periods of poor or very poor air quality than Toronto, Burlington, or Hamilton. Continued automobile-dependent development in North Oakville and the Trafalgar Moraine will result in more gridlock and traffic congestion.

If a community energy plan were introduced to regions such as Halton, economic and human costs could be reduced. A CEP can help areas to design more efficient transit and public transit systems and locate business and services within walking, public transportation, or shorter automobile travel distances.

Chapter 2: Energy Plans

Approaches for Energy Plans⁶

A *Single Issue Energy Plan* focuses on specific issues that occur within the community (e.g. a new subdivision) with the aim of developing specific actions with a short timeframe.

A *Comprehensive Energy Plan* focuses on the long-term energy direction of the community or region. The comprehensive approach addresses energy consumption (and hence cost of living), as it incorporates all aspects of community design.

Single Issue Plan – Truro, NS

Many communities in Nova Scotia Natural Gas distribution is currently a ‘hot topic’ in Nova Scotia. Truro is considering an energy park, based in an existing industrial park. The park would incorporate a central power generating facility where both the developed electricity and the reject heat would be used by industries located within the park. The plan would focus on the long-term development of industries that would benefit from stable energy costs and bring economic benefit to the community.

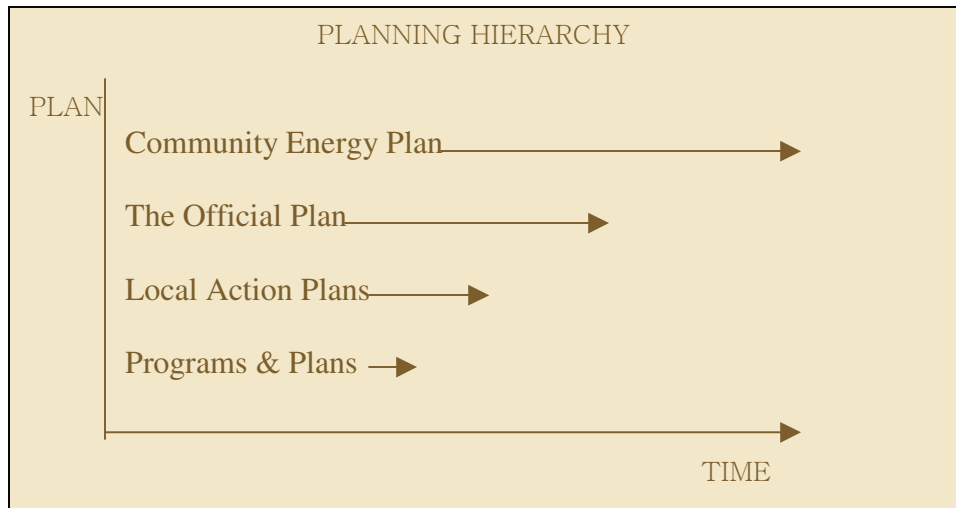
Comprehensive Energy Plan - Bowen Island, BC

The municipality can promote CEP through its land use and transportation planning procedures, building codes, bylaws, and municipal investments in infrastructure. In addition, local government can help to empower citizen participation in energy and emission management through awareness building efforts and financial incentives.
- Pembina Institute of Appropriate

A CEP is a comprehensive collection of single-issue plans. The CEP coordinates the scope and content of the more detailed single-issue secondary plans that are required for day-to-day operation. These plans are designed to increase the community’s quality of life by focusing on efficient use of local and/or sustainable energy system that lower the cost of living.

A community energy plan supersedes single-issue plans in scope and co-ordinates their development and implementation based on a single vision. This is demonstrated in Figure 1.

⁶ Community Energy Association, *Toolkit for Community Energy Planning*



Official Plan

The Official Plan may be, depending upon provincial requirements, the only document a community is legally required to produce. Official plans are broad legislation intended to stand as guiding documents for the community. Unfortunately, Official Plans generally are not designed to consider long-term sustainable planning. This is where the Community Energy Plan fits into the planning process.

As can be seen in Figure 1, the CEP forms the over-arching document that guides the development of the community, using the regulations and guidelines provided in the Official Plan. For example, where the Official Plan is used to regulate matters such as spatial arrangement (e.g. zoning), the CEP may direct the manner in which a community is constructed or designed, its serviceability or transportation needs, its proximity to services, and nearness to open areas. The factors considered by the CEP are important in defining the quality of life for the community.

The Official Plan and the Community Energy Plan

Figure 2 describes two possible growth strategies for a community: creation of the Official Plan without a Community Energy Plan and the creation of an Official Plan with a Community Energy Plan.

Scenario 1:

Without a Community Energy Plan, projects will be a disjointed collection of short-term reactions to community issues. Growth may be slow and may lose sight of long-term ambitions.

Scenario 2

In contrast, with a Community Energy Plan, a vision and targets to meet that vision will be developed for the community to follow as a guide to reach its ambitions.

Furthermore, a CEP will involve the participation of all sectors of the community in its development, meaning that the plan will benefit all members of the community.

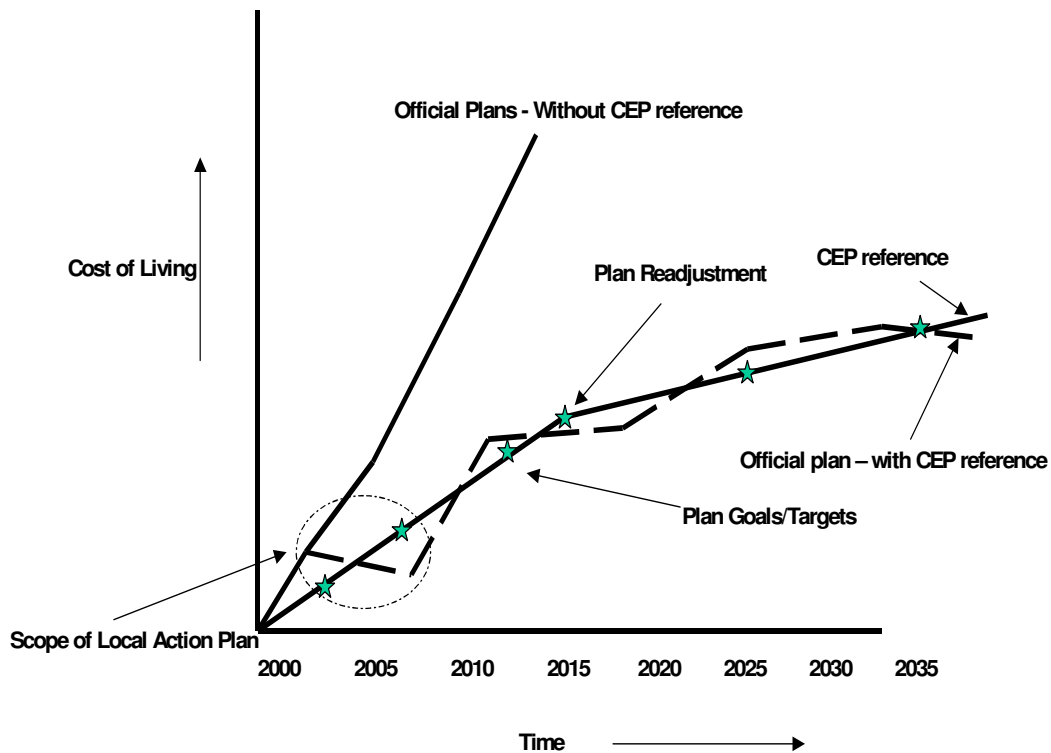


Figure 2: Relationship between OP, CEP, LAP and Targets

Local Action Plan

Developed by the Federation of Canadian Municipalities for the Partners for Climate Change Prevent program, a Local Action Plan (LAP)⁷ is a type of energy plan. The scope of a LAP falls somewhere in between the approach of a single-issue energy plan and a comprehensive energy plan. By focusing on one objective over the long-term, the LAP addresses a range of activities surrounding that objective. For example, using the reduction of greenhouse gas as its criteria for success, a LAP can address other issues such as transportation, building heating costs, deforestation, investment in renewable energies, etc.

The Difference between a Local Action Plan and a Community Energy Plan

A Local Action Plan is an excellent method for providing a long-term initiative to combat a single and persistent issue. However, by its nature, the LAP is limited in scope and focuses solely on achieving its one goal. It cannot take into account the social and economical conditions that are affected by the action of achieving the one goal.

⁷ Haycock, Russ, *Federation of Canadian Municipalities: Sustainable Communities Initiative and Green Municipal Funds: Partners for Climate Protection*

The Community Energy Plan, on the other hand, is designed to take into account all aspects of community sustainability by following the objectives from its Vision.

For example, a hypothetical ‘one horse town’ relies on a coal-generator plant for local employment and cheap energy supply. If the community were to adopt a Local Action Plan designed to target the single issue of reduction of greenhouse gases, the LAP would require that the coal plant be shutdown immediately. The result to the community would be a negative impact to the wealth of the community, with a benefit to the environment.

If the community were to instead adopt a Community Energy Plan as the over-arching methodology and use a Local Action Plan as a program, the community would continue its dependence on coal for the present, while overtime encouraging renewable energy industries and introducing energy efficient design systems. As a result there would be a steady progression towards a positive benefit to both the wealth of the community and to the surrounding environment.

Chapter 3: The Official Plan and its Capacity for CEP

Provinces create guidelines known as Municipal Acts (or as a comparative title) for communities to use as their planning legislation. Communities adopt this planning legislation to form their Official Plan.

Each province has its own definition and name for the municipal act of their communities. As well, each province also has its own criteria for what constitutes a community.

Province / Territory	Prescribing Act	Minimum 'Community' Population
British Columbia	Local Government Act	None
Alberta	Municipal Government Act	>3,500 persons
Saskatchewan	Planning & Development Act	None
Manitoba	Municipal Act / Planning Act	>1,000 persons
Ontario	Municipal Act / Planning Act	None
Quebec	Land Use Planning and Development Act	None
New Brunswick	Community Planning Act	None
Nova Scotia	Municipal Government Act	None
Prince Edward Island	Municipalities Act / Planning Act	None
Newfoundland	Urban & Rural Planning Act	None
Yukon	Municipal Act	None
North West Territories	Urban and Rural Planning Act	None
Nunavut	Planning Act	None

Table 1: Municipal Planning Regulations by Province

Provinces create guidelines that local governments follow to create their Official Plans. Official plans are approved by provinces and used to ensure compatibility between the different municipalities. Some provinces also require the development of a regional planning strategy. For example, British Columbia has developed a Regional Growth Strategy while Manitoba and New Brunswick have created Planning Districts. In other provinces, a single Act is used for all municipalities. Ontario for example proposes that

the Municipal Act apply to all incorporated communities⁸. In Alberta, a slightly different approach is taken that requires inter-municipal plans to be developed describing how municipalities will coordinate their growth and activities.

Following the definition of a ‘community’ as illustrated in Chapter 1 of this volume, all provincial areas described under their Municipal Acts that are able to develop an Official Plan are also able to develop a complimentary Community Energy Plan.

Summary of Each Province’s Official Plan and its Capacity to Develop a CEP

While none of the Municipal Acts for each province included a strategy for long-term, holistic planning, all offered a capacity for such planning in their sections dealing with energy.

In *Alberta*, issues relating to holistic planning offer the capacity to be dealt with in a CEP⁹, in particular in paragraph 632 (3) b ii “the co-ordination of municipal programs relating to the physical, social and economic development of the municipality.”

In *British Columbia*, issues relating to energy planning offer the capacity for the design of energy use using a CEP (m) planning for energy supply and promoting efficient use, conservation and alternative forms of energy.

*Manitoba’s*¹⁰ detailed requirements include several sections that refer to the creation of a CEP “the control and abatement of all forms of pollution or activities deemed to be detrimental to the natural environment” or “the spatial distribution of residential development, and the renewal, rehabilitation and improvement of neighbourhoods, and urban cores” and “the co-ordination of programs of a board or council relating to the economic, social, and physical development of the district”.

*New Brunswick*¹¹ refers indirectly to energy planning (?) as a requirement of its Community Plan through “the control and abatement of all forms of pollution of the natural environment,” and “the development of communication, utility and transportation systems”. New Brunswick also refers to rural plans for villages where no formal zoning / planning resources exist.

*Newfoundland’s*¹² approach is optional and the plan may include statements that “(1) provide for the use and conservation of energy”.

In *Nova Scotia*¹³ there is a requirement that the community develop a Municipal Planning Strategy to accompany the Official Plan. A Community Energy Plan can fulfill this

⁸ Government of Ontario, *Places to Grow*

⁹ Government of Alberta, *Municipal Government Act*

¹⁰ Province of Manitoba, *The Planning Act*

¹¹ Province of New Brunswick *Community Planning Act*

¹² Province of Newfoundland and Labrador, *Urban and Rural Planning Act*

requirement. The strategy allows the municipality to develop policies for a variety of community aspects including “the use and conservation of energy, including the height and siting of developments”.

Northwest Territories does not mention energy in its official plan, but it does call for a sustainable development of “(e) include proposals relating to the provision of public roadways, services, public buildings, schools, parks and recreation areas and the reservation of land for these and other public and community purposes; (f) include a schedule setting out the sequence in which specified areas of land may be developed or redeveloped and in which the public services and facilities referred to in paragraph (e) should be provided in specified areas”. A CEP can help in the scheduling of such community purposes.

Official Plans in Nunavut take on a similar format to those used in the Northwest Territories. However, under part 2, Article 11 of the Nunavut Land Claims Agreement, the land use plans specify “energy requirements, sources, and availability”.

*Ontario*¹⁴ has by far the shortest list of requirements, yet potentially the most difficult with which to comply. The two paragraphs that comprise the content list suggest nothing specific to allow energy related planning to be undertaken in accordance with the aims of the Official plan. Therefore, the best approach for communities in Ontario to adopt a CEP would be for each community to choose their own criteria for energy when creating their community vision.

*Prince Edward Island*¹⁵ shares Ontario’s simplistic approach to planning by placing the onus on the community to demonstrate its own compliance. The simplest linkage would be from the economic perspective.

All planning in *Quebec* is currently conducted with a regional approach. Only the Government of Quebec may establish a joint land use planning commission. Quebec makes reference to: “5(9) set out a strategic vision of cultural, economic, environmental and social development to facilitate the coherent exercise of the regional county municipality’s jurisdiction¹⁶.”

Saskatchewan communities report directly to their provincial planning office and may include within their Official Plan¹⁷ motions relating to “(k) the use and conservation of energy;” and thereby allow the community to direct action towards a community energy planning.

Yukon’s Municipal Act includes in the purposes set for official community plans to be prepared and adopted, principles that can be linked to sustainability “(a) achieve the safe,

¹³ Province of Nova Scotia, *Municipal Government Act*

¹⁴ Canadian Legal Information Institute, *Municipal Act, 2001*

¹⁵ Prince Edward Island Legislative Council Office, *Planning Act*

¹⁶ Canadian Legal Information Institute, *Land Use Planning and Development Act*

¹⁷ Province of Saskatchewan, *The Planning and Development Act*

healthy, and orderly development and use of land and patterns of human activities in municipalities”.

The above are sections taken from each province’s Municipal Act. These sections either directly relate to energy or could be used for energy issues. These sections are used as legislative guidelines by communities and integrated into their Official Plan. As can be seen, these sections are abstract and only one or two sentences in length. The CEP can be used as the descriptive tool to accompany these sections. Furthermore, since Official Plans are only 5 years in length (sometimes up to 15 years), the CEP can be used to extend the planning timeframe of energy in a community because it over-rides the Official Plan in length.

Chapter 4: The Community Energy Plan & Sustainable, Quality of Life

Using a Community Energy Plan to Design Sustainable Programs and Projects

Sustainability, as it most commonly is known:

“Meeting the needs of the present generation without compromising the ability of future generations to meet their needs.”

To reach sustainability in planning, a community must first decide what it sees as important. The Community Energy Plan is a planning tool that is used to tailor the broad definition of sustainable development to suit the unique needs and desires of communities. The needs and desires of a community forms a direction that the community will follow as it continues to grow. For example, a roundtable in Boulder, Colorado, tailored the definition of sustainability to meet the objectives of its business-oriented needs.

Round table – Business Community, Boulder Colorado

"A healthy economy is one which combines a successful, diverse business community with a strong commitment to quality of life, a diverse array of jobs and employees to fill those jobs, (which) exist at wage levels above the national median and unemployment (which) is less than 5 percent. These conditions need to be accompanied by stable tax rates and a stable tax base for the community and a full range of housing opportunities for its citizens.

"High quality leadership from the business community is available to advocate for and help shape a common future which preserves healthy economic conditions as well as a clean and accessible natural environment, freedom from congestion and a strongly-knit, better-built community. Enhanced public understanding complements this leadership and appreciation of the elements of a stable and healthy economy, such as primary jobs, balanced business sectors and adequate tax revenues. It is also complemented by community and government leadership that is balanced and reasonable, and provides predictability of government actions that affect business.

"A healthy community has educational institutions that are flexible and adaptable in preparing their students to meet the dynamic needs of local employers to be competitive in the global marketplace.

"A healthy economy has an adequate community infrastructure that includes transportation, utilities, health care, education, social services and retail and commercial services. These infrastructure elements are highly integrated to maximize their current effectiveness and are continuously reviewed to ensure that they will meet the emerging needs of the future, thus allowing the community to be adaptable to changing conditions that are not controllable at the local level.

"A healthy economic is integral to a healthy community and a desired quality of life as described by the (Boulder County) Healthy Communities Initiative. Essential ingredients include quality education; an attractive and safe environment; neighborhoods in villages, towns and cities; children, youth elders and families; quality and adequate health care and human services; diverse arts and culture; adequate and affordable housing; efficient transportation and strong and sensible leadership and government. A healthy economy includes economic activity that provides sufficient tax revenue for a community to be able to provide or invest in services, facilities and programs that either facilitate community health and remediate community ills."

Prioritizing Energy to Achieve Sustainability in Community Planning

The direction of the CEP tailors the development of programs and projects. To achieve the direction of the CEP, energy is prioritized in the development of programs and projects. Energy and energy resources are prioritized because every community project will require their use during both the implementation and the operation stage. More specifically, the use of energy will dictate the design, type, location, and other characteristics chosen for the project.

The laws of physics dictate energy consumption within every action we make!

In turn, these characteristics will dictate how the project will interact with other projects in the community, and how this interaction will achieve the overall goal of sustainability¹⁸. For example, many attempts to design for sustainability in community programs have ignored the industrial or commercial sector. Industry is a heavy user of energy, possibly the largest user, and must therefore be viewed as part of the community. Industry has a vested interest in conserving energy since the expenditure on energy can be a significant part of their annual operating cost. It is not within the mandate of the Community Energy Plan to dictate process change to the industrial sector but the community may still partner with the industry sector when it is to the advantage of both. For example, low-grade energy being rejected by industry may be recovered via a cogeneration system as a heating medium for local users. Similarly, wood-waste

¹⁸ Halton Ecological and Environmental Assessment, *Regional Municipality of Halton Report*

generated by the community as construction waste or tree trimmings can be used as a fuel for biomass fired boilers, etc. Organic waste from the community, too, may be used as compost for garden industries.



Our current use of energy segregates systems into separate sectors. For example, transportation has for a long time been considered a separate category in terms of energy consumption. Transportation even demands its own municipal department, staff, and mandate.

The treatment of transportation as a separate energy consumer is erroneous and misleading. It assumes transportation exists as an individual entity and that the only mechanism available for reducing energy consumption is the manipulation of traffic patterns or the advancement of technology – more roads, more fuel-efficient cars, etc.¹⁹. In reality, energy expenditures due to transportation of people, goods, etc. are highly dependent upon a community’s land use patterns, development intensity, etc., etc.

Our current design of transportation systems is one example that demonstrates the need to re-evaluate how we plan for energy.

If a community is to prosper over the long term, it needs to make appropriate decisions as to the most sustainable use of its local resources. For example, a community cannot cut down all its trees, sell the wood to build a pulp mill, and pretend that its capital situation remains unaffected; pulp mills need trees! It cannot be considered sustainable!

“We cannot continue to build more and more roads as a transportation solution for congestion without looking at the root cause of congestion. We have allowed urban sprawl to get out of hand. As a result, we have to rethink transportation at many levels.” The Honourable David Collenette M.P.

¹⁹ Kyoto and Sprawl Coalition, *Road Building and Sprawl*

All actions in a community are inter-related. Understanding this inter-connection can help communities develop more comprehensive programs and projects that take into account the social, environmental, and financial. For example, a project to build a four-lane highway beside a school needs to consider the possible effects of its spatial arrangement. Built beside a school, the highway could possibly expose children playing outdoors to poor air quality from the exhaust fumes of passing motorists. On the highway, there may be added congestion twice a day as parents arrive at the same time to drop-off and pick-up their children.

There are a number of other potential impacts that could result from the implementation of the project. The CEP is designed to help community planning teams consider these possibilities because planning prescribes to a set of criteria for sustainability as laid out in the Vision. When a project is developed, the economic, social, and environmental potential impacts are explored equally. It is the responsibility of the community to decide which impacts are important and what alternatives could be adopted instead. Energy and energy systems are prioritized in the design of projects as a strategy to promote the positive goals for sustainability as prescribed in the Vision.

Designing projects that prioritize efficiency in energy would mean that instead of a four-lane highway to accommodate high traffic use, perhaps a green space could be developed adjacent to the school that offers multi-user paths. On the other side of the green space, perhaps a two-lane highway with additional carpool and school bus lanes could be built.

How Sustainability Planning Can Lead to a High Quality of Life

The goal of promoting sustainability in community programs and projects is to reach a high quality of life for all members of the community, and to maintain this state as the community adapts to the many challenges caused by every day living. A high quality of life in a community would be the enjoyment of all the important aspects to the community: a healthy environment, low cost of living, high level of education, minimal level of violence, reliable access to health care, and so on.

In a Community Energy Plan, energy and resource use is used as the critical currency in project development, where the design of their use can lead to either a low or high quality of life.

A high quality of life is achieved when the revenue and benefits available within the community are balanced against the full-cost of providing that standard of living, i.e. it becomes a ‘modus operandi’ that may continue indefinitely. The CEP uses a balance sheet approach that allows communities to calculate their full cost of living and visualize a plan to maximize their quality of life.

The Illness Cost of Air Pollution in Ontario – Ontario Medical Association, 2000
It is estimated that pollution in Ontario costs the province over \$1 billion annually in terms of hospital admissions, emergency room visits, and absenteeism.

This Balance Sheet must include values for every asset and attribute of the community – But some assets and attributes are difficult to calculate - How much is clean air worth? Or, what is the cost to the community of a super-highway?

What? Slap a price tag on the environment?
✚ Putting a value on the environment has always been a controversial issue.

Activity produces externalities²⁰, meaning that activities impose environmental or social costs that are not included in the prices charged for the goods and services produced. For example, a factory that pumps effluents into a river degrades the value of that river for other users, whether those users are fish, farmers, or bathers. The factory is therefore said to impose a negative externality on the river. Environmental Valuation is a tool that attempts to quantify the value of such externalities so that all costs, impacts and benefits are known, and a more accurate and balanced decision may be made.

The balance sheet approach separates the concept of “sustainability” from that of “greenness” or “environmentally benign”, a relationship that is often the cause of confusion. A Community Energy Plan does promote environmental health, but only as an equal consideration to the other factors involved in sustainable development. By equally planning for all areas, a high quality of life and low cost of living can be influenced.

The balance sheet approach instead introduces the concept of holism into the planning process.

Generally, measuring a project’s success involves a fiscal cost to the economy, but environmental and social well-being indicators of a project may not be available for cost analysis. The Holistic Approach introduces the concept of indicators that can’t be measured in fiscal terms but are still important. For example, recent water contamination events in Walkerton, Ontario and North Battleford, Saskatchewan highlight the importance of designing environmentally safe projects to protect public health. While most of us would argue that our health is a top priority, defining this priority in fiscal terms can be difficult.

A variety of tools are available, such as Environment Canada’s Handbook on Environmental Economics²¹ and new ones are under development such as the Canadian Mortgage and Housing Corporation’s Sustainable Development Implementation Tool²², which can be used to establish acceptance criteria that describe social and environmental actions in terms of costs to the community.

²⁰ Church, Ken, *Externalities and Energy Efficiency*

²¹ Government of Canada, *Handbook on Environmental Economics*

²² Pollard, Doug, *Sustainable Development Implementation Tool*

Example: The redevelopment of a large tract of vacant land in Ottawa into a ‘traditional’ big-box shopping mall required radical redesign following objections from residents in the adjacent community. The plan was mechanically in accordance with the building codes etc but failed to integrate with the existing community. It provided nothing to the social fabric of the city and its residents.

Holistic planning is recognized as being the optimum planning process but it does present some planning challenges. The concept of holism requires all aspects of sustainability to be considered equally in terms of their impact on the community. In practice, however, a project may have to compromise some aspects of sustainability in order for the project to be a success over the long term.

Example: Denmark, as a result of the 1970’s oil crisis, developed policies that promoted wind generation as a means of providing electrical power to the national system. The use of wind is accepted but it has made the Danish power system vulnerable and dependent upon the availability of wind. At times when the wind dies or is too strong, other systems fuelled by natural gas must be quickly brought on line. In their case, the demand for “green” power necessitates the inclusion of fast-reacting, unsustainable technologies.

The Balance Sheet approach of the community energy plan is used to develop holistic and cost-effective scenarios that coordinate the operations of traditional energy sectors for the maximum efficiency of energy and resource use. By recognizing the interconnectivity of energy sectors and making the link between them, community energy plans can accomplish the larger community goals that shape a sustainable, high quality of life. Such community goals and mechanisms to achieve these, include:²³

Cleaner air – Less travel time because of better design of roads and accessible public transportation and more energy-efficient buildings reduce greenhouse gas emissions and improve health

Affordable Housing - Reduced home energy bills and lower commuting costs

Lower cost municipal services - Compact, mixed-use development reduces the service load that municipalities must budget

Preservation of open space and farmland - Efficient development to reduce urban sprawl

²³ California Energy Commission, *The Energy Yardstick: Using PLACE3S to Create More Sustainable Communities*

Job retention and creation - Reduced commercial and industrial energy costs encourage the reinvestment of savings locally - to protect existing and create more jobs.

Import Substitution and Import Replacement - Import Substitution²⁴ produces goods and services within the region normally purchased outside or not at all due to high import costs. Import Replacement²⁵ replaces imports with local products tailored to the needs and preferences of the region. Overtime, Import Substitution practices will become Import Replacement practices²⁶.

²⁴ Huskey, Lee, *Import Substitution in Frontier Regions*

²⁵ Jacobs, Jane, *Cities and the Wealth of Nations*

²⁶ Sandro, Phillip, *Jobs and Buy Local Programs: Expected Employment Effects of Public-Sector Import-Substitution in Chicago*

Conclusions

A Community Energy Plan (CEP) is a high-level methodology that prioritizes the efficiency of energy in community project development for the long-term planning of sustainable development.

A CEP is not official, but rather it is to be used as a complimentary tool to other legislation. It resides over the Official Plan and coordinates the scope and schedule of Local Action Programs and projects.

The Official Plan for communities of each province offers the capacity to develop CEPs.

CEPs prioritize the efficiency of energy and energy systems in the design of projects. This is because the use of energy will be inherent in every community project and will affect other energy projects. In CEPs, energy is seen as the main currency that relates all projects to each other. Therefore projects will be designed to combine new technologies with established projects and the built environment, thereby sharing resources and making energy use more efficient. As a result, financial and environmental costs can be minimized and local benefits/environmental services can be preserved or augmented.

A CEP can help your community achieve a sustainable high quality of life over the long term. By tailoring the abstract definition of sustainability to the needs and desires of the community, the schedule of programs and projects can be developed based on the long-term requirements of the infrastructure of the built environment. In this way, new technologies and more efficient energy systems can be integrated into the built environment over time. A Balance Sheet approach can help you measure the environmental, economic, and social impacts of various proposed project scenarios. By examining projects in a holistic manner that recognizes the interconnectivity of the traditional sectors, other community goals can be accomplished.

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Appendix A: Popular Approaches for Influencing Community Sustainability

The following are descriptions of some approaches to achieving sustainability. These approaches can be used as complimentary tools in the Community Energy Planning process.

The Natural Step (TNS) is an approach to sustainable thinking that originated in Sweden. During the 1990's, this approach was widely practiced by Swedish industries and corporations. In the corporate world, the process has had great success. The process proposes that in a sustainable environment, nature is not subject to systematically increasing:

1. Concentrations of substances extracted from the earth's crust
2. Concentrations of substances produced by society
3. Degradation of physical means

And in that society,

4. Human needs are met worldwide

Options and decisions that do not violate any of these four conditions are considered acceptable for implementation.

TNS Canada has existed since 1996, and became an official registered charity in 2001. Recently, TNS Canada is gaining popularity for use by Canadian cities. Whistler, British Columbia has already launched its TNS program and in 2004, the town of Canmore, Alberta, launched *The Natural Step to a Sustainable Canmore*. The TNS process has some positive components that work to encourage all areas of society to examine each and every action that is taken in a holistic manner. A potential drawback of the process is that unless the reviewer is well trained in the process it is sometimes difficult to arrive at consensus since many of the issues under discussion are beyond the control of the reviewer.

Partners for Climate Protection (PC) Program

The Federation of Canadian Municipalities, in conjunction with the International Council for Local Environmental Initiatives' Agenda 21 program promotes the Partners for Climate Protection (PCP) program within municipalities across Canada.

The intent of the program is to encourage municipalities to reduce greenhouse gas emissions within their own municipal operations by 20% and within the entire community by 6%. The program is voluntary and the FCM offers guidance and networking to municipalities following this program. The five-milestone approach begins with a greenhouse gas audit to determine the required 1990 datum level. The second milestone involves a visioning process followed by targets and goal setting, and followed by the eventual implementation of the plan. The level of interest in the program is high but the number of communities reaching the implementation milestone remains low. This

is in large part due to the fact that allocating resources for the development of the greenhouse gas baseline data remains a major hurdle for many communities.

Eco-Budget

The development of an Eco-Budget began testing in Europe, 2004, as a means of integrating environmental issues into accepted municipal accounting practices. A greenhouse gas reduction target is valued using generally accepted market values (currently ~\$10 / tonne) and each department is allotted its portion of the reduction target.

The concept behind the program is that with the departments now affected by the financial costs of their actions, they will actively take responsibility to lower their emissions. In 2004/2005, testing of the eco-budget has just been completed in Vaxjo, Sweden and preliminary reports indicate that significant success was achieved with an element of friendly competition being developed between departments to inspire each other to reduce emissions.

Smart Growth

“Smart Growth” refers to land use and development practices that enhance the quality of life in communities and preserve ecological integrity. The concept of Smart Growth has been criticized by some as being too supportive of developers. Nonetheless it does encourage actions that are economically sound, environmentally friendly, and supportive of community livability.

Its common objectives include encouraging growth in existing communities with existing infrastructure (i.e. infill, and brownfield development), preservation of open space, farmland, natural beauty and critical environmental areas, a variety of transportation choices, mixed land uses, compact building design, walkable communities, housing opportunities and choices, and integrating decisions on land use planning, transportation, infrastructure and environment.

In Canada, Smart Growth originated in BC with a number of organizations and municipalities adopting Smart Growth principles. For example, New Westminister has redeveloped its planning process around Smart Growth principles and defined for the community its own interpretation of sustainability. By contrast, In Ontario the Ministry of Municipal Affairs and Housing has instigated Smart Growth Zones for the entire province²⁷. A panel of experts for each zone has provided ideas for the improvement of practices within each province. Each of the five zones recognizes that the priorities will be different, depending upon the local issues and politics of the day. For example, the priorities for Eastern Ontario include:

- Broadband technologies
- Globally traded goods and services

²⁷ Government of Ontario, *Places to Grow*

- The development of strong local economies that build on inherent strengths
- Efficient infrastructure including a good transportation network
- A quality of life that attracts innovation and creativity

The priorities for Eastern Ontario are clearly aimed at the business community. By contrast, the central zone, that including Toronto, has only two priorities: transportation and waste.

Cities Plus

The cities^{PLUS 30} International Network is an initiative of Canada's Greater Vancouver Regional District, the Sheltair Group, and the Sustainable Cities Foundation (home to the International Centre for Sustainable Cities).

cities^{PLUS 30} aims to foster urban sustainability by encouraging 30 communities to join an information-sharing network. The objective of the network is to collaborate over a period of four years by sharing tools, talent and experience. Each community follows an 'adaptive management framework' developed by the cities^{PLUS 30} Team. After four years, the 30 communities will present their accumulated learning at the events associated with the 30th Anniversary of UN Habitat at Vancouver^{PLUS 30} in 2006.

cities^{PLUS 30} anticipates that exchanges of personnel on short or long-term secondment might be undertaken, as well as study tours to see results in the field over the course of four years.

Appendix B: Existing Methodologies and Active Parties

BC Energy Aware Committee – A Tool Kit for Community Energy Planning
(<http://www.energyaware.bc.ca>)

Environment Canada, Atlantic Coastal Action Program – Sharing the Challenge

Environment Canada – Planning for Change

Envision (<http://www.envision.com>)

Government of Saskatchewan – Sustainable Community Planning Program –

Greenprint (http://www.gov.sk.ca/enermine/about/gp_bkgrd.htm)

California Energy Commission – Energy Aware Planning Guide
(http://www.energy.ca.gov/reports/energy_aware_guide.html)

US Environmental Protection Agency – Green Communities
(<http://www.epa.gov/greenkit/>)

Agriculture – Agri-foods Canada - Agricultural Rural Minority Language Community
Planning Initiative (http://www.agr.gc.ca/policy/rural/cpi/index_e.phtml)

Federation of Canadian Municipalities – Green Enabling Funds (<http://www.fcm.ca>)

Pembina Institute – Eco-Efficient Communities Initiative (<http://www.pembina.org/>)

INAC – Comprehensive Community Planning
Office of Energy Efficiency – Aboriginal and Northern Climate Change Fund
Canadian Social Planning Network – (<http://www.ccsd.ca/cspn>)

Canadian Rural Partnership – Rural Development Initiative
(http://www.rural.gc.ca/home_e.phtml)

Social Planning and Research Council of BC – (<http://www.sparc.bc.ca/cdi/>)

Human Resources & Development Canada – Supporting Communities Partnership
Initiative (homelessness) – (<http://www21.hrdc-drhc.gc.ca/>)

International Council for Local Environmental Initiatives (ICLEI) – Cities for Climate
Protection (<http://www.iclei.org/ccp-au/ccpfolder/ccp.htm>)

Sheltair Corporation (<http://www.sheltair.com>)

Green Communities Association (<http://www.gca.ca>)

Conservation Council of Ontario – GreenOntario (<http://www.greenontario.org>)

Vestar (http://www.vestar.net/projects/govt_projects.html)

Cullbridge – Tools of Change (<http://www.toolsofchange.com/English/FirstSplit.asp>)

Harmony Foundation – (<http://www.harmonyfdn.ca/bss2000.htm>)

Compass Resources – (<http://www.compassrm.com>)

Canadian Energy Research Institute – (<http://www.ceri.ca>)

Smart Growth BC – Community Assistance Program (<http://www.smartgrowth.bc.ca>)

NRCan / Community Energy Systems Group – Community Energy Systems program
(http://www.nrcan.gc.ca/es/etb/cetc/cetc01/htmldocs/research_programs_ces_e.html)

PlaceMattersTools <http://www.placematterstools.com/TCDDM/HOME2.htm>