

Integrated Community Energy Systems, District Energy and the Provincial Policy Statement

BACKGROUND REPORT

Prepared by The Planning Partnership for:

Toronto and Region Conservation Authority (TRCA) in partnership with the Canadian District Energy Association (CDEA)

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Introduction

The Provincial Policy Statement (PPS) is issued under the Planning Act to provide policy direction for land use planning and development across Ontario. The latest PPS was issued in 2005 and is currently under review by the Ministry of Municipal Affairs and Housing. Although the formal consultation period has ended, the review process continues and Minister Kathleen Wynne has invited the Canadian District Energy Association (CDEA) to provide a submission on what a PPS policy for district energy, as a key component of integrated community energy systems (ICES), would look like.

The TRCA's interest in energy stems from its mandate to take action and demonstrate leadership on climate change through the development and promotion of mitigation and adaptation strategies. The TRCA carries out this mandate through a number of programs, including Community Transformations, which is leading the develop of this submission on the PPS, in partnership with the Canadian District Energy Association (CDEA), Municipal QUEST (Quality Urban Energy Systems of Tomorrow), and the Canadian Green Buildings Council (CaGBC) Greater Toronto Chapter.

While the overarching topic of this submission is ICES, the focus will be on district energy, which is a key component of ICES that has yet to be incorporated into Provincial planning and energy frameworks. Other aspects of ICES, including compact development, energy efficient buildings, sustainable transportation, and renewable energy are already being addressed through the Provincial Policy Statement (2005), Places to Grow (2006), The Big Move (2009), the Green Energy Act (2009) and updates to the Building Code (1992). It is the position of the TRCA and its partners that district energy has the potential to play a significant role in energy conservation within urban communities across the province, and that the PPS should reinforce this potential. As such, the objective of this group submission will be to encourage the Province to directly reference district energy in the PPS as a way to elevate the profile of this technology as a key component of ICES.

The purpose of this Background Report is to provide an informative basis upon which selected stakeholders can build consensus and provide input and feedback on a proposed district energy policy for the PPS. A workshop will be held to review this Background Report and refine the recommendations prior to preparing a final submission to Minister Wynne.

This Background Report begins with a description of ICES and district energy and how they relate to land use planning. Two model policies from local municipalities are presented, followed by a general overview of Provincial policies that address ICES, and a more detailed review of energy policies and programs in Ontario. This Report concludes with an analysis of the Provincial Policy Statement and options for how district energy may be referenced within that document.

Understanding Integrated Community Energy Systems & District Energy

What are Integrated Community Energy Systems (ICES)?

Integrated Community Energy Systems (ICES) involve taking advantage of cross-sectoral opportunities in the areas of land use, infrastructure, building, water and sanitation, transportation and waste to curb energy demand and reduce greenhouse gas emissions at the local level, while increasing energy security, enhancing the quality of life and realizing financial benefits for residents.¹

The leading organization working on ICES in Canada, QUEST, has identified the following six guiding principles for any ICES:

- 1) Improve efficiency – First, reduce the energy input required for a given level of service (i.e. encourage the use of mixed land uses and energy efficient buildings);
- 2) Optimize “exergy” – Avoid using high-quality energy in low-quality applications;
- 3) Manage heat – Capture all feasible thermal energy and use it, rather than exhaust it;
- 4) Reduce waste – Use all available resources, such as landfill gas, gas pressure drops and municipal, agricultural, industrial and forestry wastes;
- 5) Use renewable resources – Tap into local biomass, geothermal, hydro, solar and wind energy; and
- 6) Use grids strategically – Optimize use of grid energy and as a resource to optimize the overall system and ensure reliability.²

ICES, by its very nature, incorporates numerous strategies for reducing energy demand and harmful emissions, including compact development patterns, transportation demand management, water and energy efficient buildings and public infrastructure, and the incorporation of renewable energy, district energy and cogeneration (combined heat and power) facilities. With the exception of district energy and cogeneration, the Provincial government has begun addressing each of these strategies within policies and legislation enacted and adopted over the last seven years.

What is district energy?

District energy (DE) refers to systems that generate and distribute thermal energy (heating and/or cooling) at a community scale. The infrastructure includes a localized centre where energy is generated, and a network of buried insulated pipes that distribute that energy to buildings within a defined geographic area. A variety of

¹ Paraphrased from: QUEST (Quality Urban Energy Systems of Tomorrow). (2010, September). [ICES Municipal Policy Toolkit](#). Ottawa. p.5.

² QUEST (2010, September). p.8.

input fuels can be used with district energy, including biomass, biogas, renewable energy forms, natural gas and cool water. Natural gas is the most commonly used fuel source with district energy. Due to their smaller-scale, district energy plants are more adaptable than traditional energy systems, and are well placed to integrate alternative energy forms as they become more available.

Compared to district energy, conventional energy systems involve generating electricity at a central power station, transmitting that energy (usually through overhead power lines, known as the “grid”) to substations near customers, and then finally on to customers through lower voltage power lines and pole-mounted transformers. Common input fuels in Ontario include nuclear, hydro and natural gas.

The main benefit of district energy is that it can provide energy more efficiently than standard energy systems when used in areas with medium to high development densities and an appropriate mix of uses. Standard energy systems lose a significant amount of energy through transmission, whereas district energy delivers more of the energy generated to the customer. This more efficient use of energy produces fewer greenhouse gases (GHGs) emissions, which is the central goal of all climate change action plans, including the Provincial government’s.³

The core challenge associated with district energy is that it requires high levels of cooperation among developers, utilities, and municipalities, and if implementation is not managed effectively cost inefficiencies can be incurred, and passed on to the end user. Further, although district energy is a proven infrastructure strategy for reducing GHGs, the financial benefits of greater energy efficiency are not typically passed on to the customer; rather they are retained by the provider to pay down initial infrastructure costs.

What is combined heat and power (CHP)?

When electricity is generated, a certain amount of “waste” heat is produced as a by-product, which standard generation facilities emit into the environment. Combined Heat and Power (CHP), also known as cogeneration, is a process that captures these “waste” heat emissions and uses them for heating purposes or as an input for district heating (known as Combined Heat and Power District Heating, or CHPDH).

Why should the Province support district energy?

The Province has undertaken a number of initiatives in support of ICES as part of its efforts to reduce greenhouse gas emissions that contribute to climate change. It has supported renewable energy, promoted energy conservation, outlined a plan for public transit and legislated more efficient development patterns through the Provincial Policy Statement, Places to Grow: Growth Plan for the Greater Golden Horseshoe, The Big Move, the Green Energy Act, and the Building Code. District energy is an integral component of ICES that has yet to be addressed, and it holds significant potential for achieving energy use reductions and efficiencies at the community scale. According to the Canadian District Energy Association, some research has found that District Heating with Combined Heat and Power (CHP) is the cheapest method of cutting carbon and has one of the lowest carbon footprints of all fossil-fuel based energy systems.⁴ District energy can also be more reliable, continuing to run during major outages on the electricity grid.

³ Province of Ontario. (2007, August). Go Green: Ontario’s Action Plan on Climate Change. Toronto.

⁴ District Energy Association of Canada. (2011). FAQ: What are the main advantages of district energy?. Accessed online at <http://www.cdea.ca/faq>

How is district energy a planning issue?

The Provincial Policy Statement (PPS) provides the overarching policy direction for planning and development in Ontario, with a strong focus on promoting “long-term prosperity, environmental health and social well-being” (Part V, Section 1.0). To that end, the PPS includes a number of policies to promote the efficient use of energy as well as the uptake of alternative energy sources that produce fewer greenhouse gases than traditional fuels. The inclusion of these policies is an acknowledgement that energy can impact our economic prosperity, environmental health and social well-being, depending on how reliable the energy supply is and how much pollution and greenhouse gases it generates. Existing PPS policies refer to “alternative” and “renewable” energy systems, and there is room to introduce policies for district energy, which is typically fuelled by natural gas but enables the use of renewable fuels, as part of the comprehensive approach for achieving the Province’s ICES goals for new and existing communities.

Moreover, the implementation of district energy requires cooperation among developers, the municipality and utilities early on in the planning and development process. These partners must work together to develop a coordinated approach to implementation that is timely, avoids duplication of infrastructure and services, and most basically, ensures that a place for pipes and the energy centre is accommodated in plans as they are submitted for approval.

Putting district energy clearly on the development radar through PPS policies will help support the efficient and coordinated provision of cleaner energy in suitable communities across Ontario. District energy policies within the PPS would also reinforce the validity of local efforts to improve energy efficiency through energy mapping exercises, official plan policies, and sustainable guidelines.

Model District Energy Policies

East Gwillimbury Consolidated Official Plan 2031 (2010)

The Town of East Gwillimbury's most recent Official Plan (2010) includes a comprehensive set of policies addressing district energy, with implementation requirements for sites that are found to be viable candidates for district energy. The inclusion of district energy policies in the Official Plan stems from the adoption of the Town's first-ever Community Energy Plan (CEP) in 2009.⁵ The CEP includes recommendations for reducing greenhouse gas emissions over the planning period (to 2031), largely by improving energy efficiency (in the residential, employment and transportation sectors) and increasing the use of renewable energy sources, but also by creating a district energy system serving the majority of the Town.⁶

Policies within Section 7.7.1 of the Official Plan (Exhibit 1) establish triggers and requirements for developers and the Town to assess the viability of district energy for candidate sites, such as large developments with higher densities and those located in key urban planning areas (e.g. local centres, employment areas and post-secondary institutions). In response to resistance from the development community, the Official Plan policies establish a strong role and clear responsibilities for the Town in promoting and assessing the viability of district energy, to balance the onus being placed on the development community.⁷ This shared responsibility for assessing the viability of district energy is complemented by a *requirement* for developers to implement district energy infrastructure in the detailed engineering design stage, if it is found to be feasible. The East Gwillimbury Official Plan also includes a definition of district energy that provides a description of the infrastructure and ownership of the system, with no reference to fuel sources or energy efficiency achievements.

Exhibit 1. East Gwillimbury Official Plan – District Energy Policies

SECTION 7.7 ENERGY PRODUCTION & RELATED INFRASTRUCTURE

7.7.1 DISTRICT ENERGY

The Town's Community Energy Plan has established that community or district energy solutions are necessary to achieve the Town's energy and greenhouse gas reduction targets for the planning horizon of this Plan. As the majority of the Town's growth is focused within the Urban Area, there is an opportunity to implement community energy in conjunction with new development.

Objectives

- i) Encourage energy efficient building design and construction techniques that minimize space heating and cooling energy consumption;
- ii) Encourage the establishment of a district energy system within the Urban Area;
- iii) Promote the development of renewable energy production facilities including wind, solar, and geothermal sources.

⁵ Planning & Building Services, Policy Branch. (2010, June 28). Staff Report P2010-50: Adoption of the Consolidated Official Plan. Town of East Gwillimbury. p.10.

⁶ Town of East Gwillimbury. (November, 2009). Community Energy Plan. p.38.

⁷ Planning & Building Services, Policy Branch. p.10-11.

Policies

- 7.7.1.1 The Town will establish standardized guidelines and technical standards to encourage the implementation of a district energy system.
- 7.7.1.2 Large scale developments and/or Secondary Plans that propose higher densities and/or compact energy intensive employment/institutional uses will be required to include an assessment of the viability of a district energy system (DES). The Town may require a peer review of submitted supporting information requirements, at the cost of the applicant.
- 7.7.1.3 The Town shall work with the development industry and other partners to undertake District Energy Feasibility Studies as part of and prior to the approval of development of the following areas identified on Schedule A-1 to this Plan:
- i) GO Transit Station / Major Local Centre
 - ii) Post-Secondary Institution
 - iii) Employment Areas adjacent to 400-series Highways
 - iv) Queensville Major Local Centre

In recognition of the Town's interest in pursuing district energy systems and the development of an energy services entity to delivery such services, the Town will consider the use of municipal resources to assist in the preparation of the studies noted above. In this regard, the Town will pursue funding partnerships with other government and non-government agencies to advance the establishment of district energy services to development areas in the Town.

- 7.7.1.4 Where a feasibility study has determined that a district energy system is achievable, the Town shall require development to incorporate the necessary infrastructure for district energy in the detailed engineering design stage, including hydronic systems and pre-servicing with insulated pipes within a dedicated trench in the public right-of-way. Where such pre-servicing is required on private lands, the owner shall provide the necessary easements or rights-of-way to the satisfaction of the Town.
- 7.7.1.5 For areas designated for Employment or Commercial Mixed Use, the possibility of a multi-utility district energy system should be explored by the proponent of the development application(s). This could include not only district heating and cooling, but also process steam, compressed air and other utilities.
- 7.7.1.6 The Town shall work with the retail gas and electric utilities to ensure that the maximum economic, technical and environmental synergies are captured as district energy is deployed.

SECTION 9.3 DEFINITIONS:

District Energy System – a system of infrastructure providing thermal energy (heating and/or cooling) through a piped system, from a central plant, or network of plants to buildings for which such infrastructure is owned, operated and managed either by the Town or by the Town in partnership with private parties subject to the approval of Council. Such system may include electricity generation and distribution through the process of co-generation or combined heat and power (CHP).

Official Plan Amendment 22, Pickering Official Plan Edition 6 (January 2012 Draft) – Seaton Urban Area

The purpose of the City of Pickering’s OPA 22 (January 2012 Draft)⁸ is to implement the Central Pickering Development Plan for the Seaton Urban Area, which is intended to develop as a highly sustainable network of communities. One aspect of sustainability that is promoted through OPA 22 and the complementary Seaton Sustainable Place-Making Guidelines (July 2011 Draft) is energy efficiency, and specifically district energy.

In addition to general references that support sustainability and the efficient use of infrastructure, OPA 22 includes specific policies for district energy under Section 11.43, which requires developers to consider providing district energy (subject to a feasibility study) at appropriate locations within two specific neighbourhoods (Exhibit 2). New policies for streetscape design (under Section 14.8) also encourage the planning of district energy infrastructure early on in the development approval process to minimize disruption and ensure it is cost effective.

District energy is also promoted under section 5.1 of the Seaton Sustainable Place-Making Guidelines, which are required to provide minimum standards and benchmarks to be achieved in the Seaton Urban Area, in accordance with Section 11.38 (b) of OPA 22. Under Section 5.1, the Guidelines encourage the provision of renewables-based district energy, where feasible. The provision of district energy generates 20 points toward a development’s sustainability rating (referred to as its certification level), as assessed through the Sustainability Checklist of the Guidelines, which must be completed as part of the Draft Plan of Subdivision.

No definitions of district energy are provided in either OPA 22 or the Guidelines.

Exhibit 2. District Energy Policies for the Seaton Urban Area, Pickering ON

PICKERING OPA 22

CHAPTER 11 URBAN NEIGHBOURHOODS

Central Pickering Development Plan Goals

In addition to those sustainable principles, development of the Seaton portion of Central Pickering is guided by seven goals set out in the Central Pickering Development Plan as follows:

...

Servicing: Ensuring that the network of utilities required to serve the new urban community minimizes impacts on the environment, maximizes efficiency and use of existing infrastructure, and minimizes lifecycle costs.

...

⁸ The Draft OPA 22 (January 2012) was kindly provided by Sorensen Gravely Lowes, the consulting firm retained by the City of Pickering to prepare the amendment.

District Energy

11.43 City Council shall require consideration be given to District Energy being supplied at an appropriate location within the Seaton Urban Area subject to a feasibility assessment for lands in Neighbourhood 20: Thompson's Corners and also when future infill and redevelopment is contemplated in the Community Node in Neighbourhood 16: Lamoreaux.

CHAPTER 12 RURAL SETTLEMENTS

Thompson's Corners Neighbourhood Policies

...

12.22 City Council,

...

(m) shall recognize that the locations of:

...

- (iv) a district energy facility on Schedule XII Neighbourhood 20: Thompson's Corners is conceptually shown and its location is to be determined by a feasibility study that demonstrates such a facility can be successfully operated and integrated into the community in consultation with the landowners and utility providers; and

CHAPTER 13 DETAILED DESIGN CONSIDERATIONS

Streetscapes

...

14.8 City Council shall,

...

- s) encourage utilities and infrastructure related to district energy to be considered and planned early in the development approvals process in order to minimize disruption and be cost effective; and

SEATON SUSTAINABLE PLACE-MAKING GUIDELINES

5.0 GREEN INFRASTRUCTURE & BUILDING

5.1 Energy Efficiency

1. Where feasible, alternative energy delivery systems should be provided, such as renewables-based district energy for heating and cooling. District energy is the technology for providing heating (or other forms of energy) from a central plant to multiple users, and can conserve resources and reduce air emissions.

APPENDIX A. SUSTAINABILITY CHECKLIST

E71.sp + dp A district energy system is connected to the development. (No. of points = 20)

Provincial Regulations, Policies & Programs

The purpose of this review is to provide a general review of how Provincial regulations, policies and programs have addressed ICES, and a more detailed review of energy regulations and programs to identify any items that may require cross-referencing or coordination with a PPS policy on district energy, as an integral component of ICES.

Provincial Regulations, Policies & Programs for ICES

- Provincial Policy Statement (2005)
- Places to Grow: Growth Plan for the Greater Golden Horseshoe (2006)
- Green Energy Act (2009)
- Building Code (1992)
- The Big Move (2009)
- Feed-in Tariff for Renewable Energy
- Clean Energy Standard Offer Program (CESOP)

Over the last seven years, a number of Provincial policies, regulations and programs have been implemented in support of the built form, transportation and energy supply aspects of ICES. With regard to land use, the Provincial Policy Statement (2005) and Places to Grow (2006) establish a framework for ICES by requiring more compact forms of transit supportive development. Most notably, the growth management regime established under Places to Grow includes minimum density requirements for greenfield developments and urban growth centres, minimum intensification requirements within the built boundary, and an urban structure based on transit supportive centres and corridors. Building on this growth management framework, The Big Move (2009) then establishes a regional transportation plan that prioritizes the movement of people by public transit, bicycles and walking, with a reduced emphasis on car travel.

In terms of energy, the recent update to the Building Code (effective January 1, 2012) prescribes enhanced energy efficiency standards, while the Green Energy Act (2009) has enabled growth in the renewable energy sector (e.g. solar, biogas, biomass, landfill gas, wind and water). Under the Green Energy Act, the Ontario Power Authority (OPA) has been authorized to introduce a Feed-in Tariff for Renewable Energy, which provides a guaranteed pricing structure for producers of renewable energy. The OPA has also begun procuring energy from Combined Heat and Power and Energy Recovery projects under the Clean Energy Standard Offer Program (CESOP), which provides a standard pricing regime and streamlined application process.

Combined, these regulations, policies and programs establish a strong framework for ICES in municipalities across the province.

Provincial Energy Regulations and Programs and District Energy

Consistent with the findings of a recent research paper on district energy commissioned by the Ontario Power Authority, our own review of the Electricity Act (1998), the Green Energy Act (2009) and the Building Code revealed “there is little explicit policy in Ontario regarding district energy” (OPA, 2010, v). While the Electricity Act outlines a framework for Ontario’s electricity market place with objectives related to the safety, sustainability,

and reliability of the electricity supply, there is no specific reference to district energy. Similarly, the Green Energy Act is highly focused on promoting renewable energy sources (e.g. solar, biogas, biomass, landfill gas, wind and water), with a secondary focus on energy conservation, and no reference to district energy as a strategy for achieving greater energy efficiency. The Building Code is another relevant regulation in so far as it provides standards for how energy efficient buildings must be, however, it does not provide efficiency standards for the energy systems that power buildings, and as such does not refer to district energy. Also, the Building Code standards for connection equipment make no reference to the type of energy system (e.g. standard or district energy) to which the building connects.

One supportive program is run by the Ontario Power Authority (OPA), who has begun procuring energy from Combined Heat and Power and Energy Recovery projects under the Clean Energy Standard Offer Program (CESOP). Through this program, the OPA provides a standard pricing regime and streamlined application process for proponents that meet a set of requirements. The purpose of the program is to facilitate increased development of CHP and Energy Recovery Facilities that have a maximum capacity of 20 MW and are connected to a Distribution System in an area of the Province where these types of energy generation systems can be effectively integrated.

The CESOP provides “Standard Definitions” for both the CHP and Energy Recovery Standard Offer Programs, which may be relevant for a PPS policy. These definitions include:

CHPSOP Appendix 1 Standard Definitions Version 1.0.1 (June 15, 2011)

36. *CHP Generating Facility* means an Electricity generating facility located in Ontario which generates Electricity and Useful Heat Output from natural gas and delivers that Electricity through a meter in accordance with all Laws and Regulations to a Distribution System or an Electrical Host Facility and delivers Useful Heat Output through a meter to one or more Host Facilities.

ERSOP Appendix 1 Standard Definitions Version 1.0.1 (June 15, 2011)

23. *CHP Generating Facility* means a gas-fired electricity generating facility in the Province of Ontario that utilizes combined heat and power technology.

60. *Eligible Primary Energy Source* means either By-Product Fuel or Under-Utilized Energy that are not derived from an electricity generating facility, each as approved by the OPA in its sole discretion, and which, for greater certainty, does not include any Renewable Fuel, Municipal Solid Waste, Fossil Fuel, peat or peat-derived products, or hazardous waste.

61. *Eligible Supplementary Fuel* means natural gas.

64. *Energy Recovery Facility* means an Electricity generating facility located in Ontario which utilizes an Eligible Primary Energy Source as its Primary Energy Source and only supplements it with an Eligible Supplementary Fuel, and delivers that Electricity through a meter in accordance with all Laws and Regulations to a Distribution System.

Findings

For the purposes of a new PPS policy on district energy, as an integral component ICES, this review of Ontario's energy regulations and programs indicates that the only references to district energy that may need to be cross-referenced are found in the Standard Definitions of the OPA's CESOP. This review also points to strong support for ICES, but a lack of policy support for district energy at the provincial level. The lack of reference to district energy may be attributed to the government's strong focus on renewable energy, rather than fuel sources such as natural gas, which are most commonly used with district energy. Nonetheless, district energy is a key component of ICES that is compatible with the government's energy conservation priorities, greenhouse gas emission reduction targets, and its built form directives for more compact and mixed use communities.

The Provincial Policy Statement

As mentioned earlier in this Report, the Provincial Policy Statement (PPS) provides policy direction for planning and development in Ontario. The PPS includes policies regarding growth management, employment, housing, parks and open spaces, infrastructure, resource management and protecting against natural and man-made hazards. The document is relatively brief and addresses each of these items at a high level. It is not intended to provide detailed direction; rather it is intended to convey the spirit of the Province's planning intentions while serving as a mandatory guide for municipalities as they develop their own more detailed official plans, secondary plans, zoning by-laws and other planning-related policies and regulations. Understanding the intended scope of the PPS will be essential to formulating effective district energy policy that the Province can smoothly incorporate as part of the current review.

A detailed review of the PPS revealed four sections under *Part V: Policies* where district energy policies could be incorporated as part of the effort to promote ICES:

- Section 1.6 Infrastructure and Public Service Facilities – currently includes policies for sewage and water, transportation systems, transportation and infrastructure corridors, airports and waste management.
- Section 1.7 Long Term Economic Prosperity – refers to a broad array of priorities that underpin the PPS (e.g. resource management, urban revitalization, land use compatibility, multi-modal transportation). Includes support for “alternative energy systems” and “renewable energy systems”.
- Section 1.8 Energy and Air Quality – promotes land use and urban design strategies that achieve energy efficiency, as well as “renewable energy systems” and “alternative energy systems”.
- Section 6.0 Definitions – includes definitions for key terms used in the PPS, including “renewable energy systems” and “alternative energy systems”. (Exhibit 3)

The remainder of this section of the Background Report provides:

- a) an analysis of whether or not the PPS definition for “alternative energy systems” encompasses district energy; and,
- b) preferred options for referencing district energy in the PPS.

Exhibit 3. Existing PPS Policies

1.6 INFRASTRUCTURE AND PUBLIC SERVICE FACILITIES

- 1.6.1 Infrastructure and public service facilities shall be provided in a coordinated, efficient and cost-effective manner to accommodate projected needs.

Planning for infrastructure and public service facilities shall be integrated with planning for growth so that these are available to meet current and projected needs.

- 1.6.2 The use of existing infrastructure and public service facilities should be optimized, wherever feasible, before consideration is given to developing new infrastructure and public service facilities.

- 1.6.3 Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services.

Where feasible, public service facilities should be co-located to promote cost-effectiveness and facilitate service integration.

1.7 LONG-TERM ECONOMIC PROSPERITY

- 1.7.1 Long-term economic prosperity should be supported by:

- a) optimizing the long-term availability and use of land, resources, infrastructure and public service facilities;
- b) maintaining and, where possible, enhancing the vitality and viability of downtowns and mainstreets;
- c) promoting the redevelopment of brownfield sites;
- d) providing for an efficient, cost-effective, reliable multi-modal transportation system that is integrated with adjacent systems and those of other jurisdictions, and is appropriate to address projected needs;
- e) planning so that major facilities (such as airports, transportation/transit/rail infrastructure and corridors, intermodal facilities, sewage treatment facilities, waste management systems, oil and gas pipelines, industries and resource extraction activities) and sensitive land uses are appropriately designed, buffered and/or separated from each other to prevent adverse effects from odour, noise and other contaminants, and minimize risk to public health and safety;
- f) providing opportunities for sustainable tourism development;
- g) promoting the sustainability of the agri-food sector by protecting agricultural resources and minimizing land use conflicts; and
- h) providing opportunities for increased energy generation, supply and conservation, including alternative energy systems and renewable energy systems.

1.8 ENERGY AND AIR QUALITY

- 1.8.1 Planning authorities shall support energy efficiency and improved air quality through land use and development patterns which:
- a) promote compact form and a structure of nodes and corridors;
 - b) promote the use of public transit and other alternative transportation modes in and between residential, employment (including commercial, industrial and institutional uses) and other areas where these exist or are to be developed;
 - c) focus major employment, commercial and other travel-intensive land uses on sites which are well served by public transit where this exists or is to be developed, or designing these to facilitate the establishment of public transit in the future;
 - d) improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion; and
 - e) promote design and orientation which maximize the use of alternative or renewable energy, such as solar and wind energy, and the mitigating effects of vegetation.
- 1.8.2 Increased energy supply should be promoted by providing opportunities for energy generation facilities to accommodate current and projected needs, and the use of renewable energy systems and alternative energy systems, where feasible.
- 1.8.3 Alternative energy systems and renewable energy systems shall be permitted in settlement areas, rural areas and prime agricultural areas in accordance with provincial and federal requirements. In rural areas and prime agricultural areas, these systems should be designed and constructed to minimize impacts on agricultural operations.

6.0 DEFINITIONS

Alternative energy systems: means sources of energy or energy conversion processes that significantly reduce the amount of harmful emissions to the environment (air, earth and water) when compared to conventional energy systems.

Renewable energy systems: means the production of electrical power from an energy source that is renewed by natural processes including, but not limited to, wind, water, a biomass resource or product, or solar and geothermal energy.

The Definition of “Alternative Energy Systems”

Prior to proceeding with a proposal to amend the PPS, it is important to assess whether the definition for “alternative energy systems” under Section 6.0 of the PPS encompasses district energy. Alternative energy systems are defined as:

sources of energy or energy conversion processes that significantly reduce the amount of harmful emissions to the environment (air, earth and water) when compared to conventional energy systems.

When this definition is dissected, a number of criteria or defining features of “alternative energy systems” can be identified, as follows:

- source of energy (e.g. natural gas, wind, solar, etc.)
- energy conversion process
- significantly reduces the amount of harmful emissions to the environment when compared to conventional energy systems

Since district energy is not a source of energy, and is more than an energy conversion process, it does not appear to clearly satisfy the first two criteria, and as such it could be argued that district energy is not an “alternative energy system” based on the existing PPS definition. District energy can, however, meet the third criteria, it can enable more efficient use of energy when used in combination with renewable fuels or combined heat and power and therefore can reduce the amount of GHG emissions and other air pollutants. This suggests there is room to incorporate district energy into this definition, if there was a desire to do so. As a side note, the Ministry of Municipal Affairs and Housing’s own PPS InfoSheet addressing renewable and alternative energy explicitly identifies district energy as an effective strategy to achieve greater energy efficiency.⁹ This suggests that there may be support for clarifying the definition to make it clearer that district energy is considered an alternative energy system under the PPS, if that is in fact the intention.

⁹ Ministry of Municipal Affairs and Housing. (2007). Info Sheet: Energy Conservation Efficiency and Supply. Province of Ontario, Toronto.)

Options for Promoting District Energy in the PPS

Based on this review of the PPS, four options for incorporating a district energy policy into the PPS were identified, two of which are preferred (Figure 1). Each option is described below.

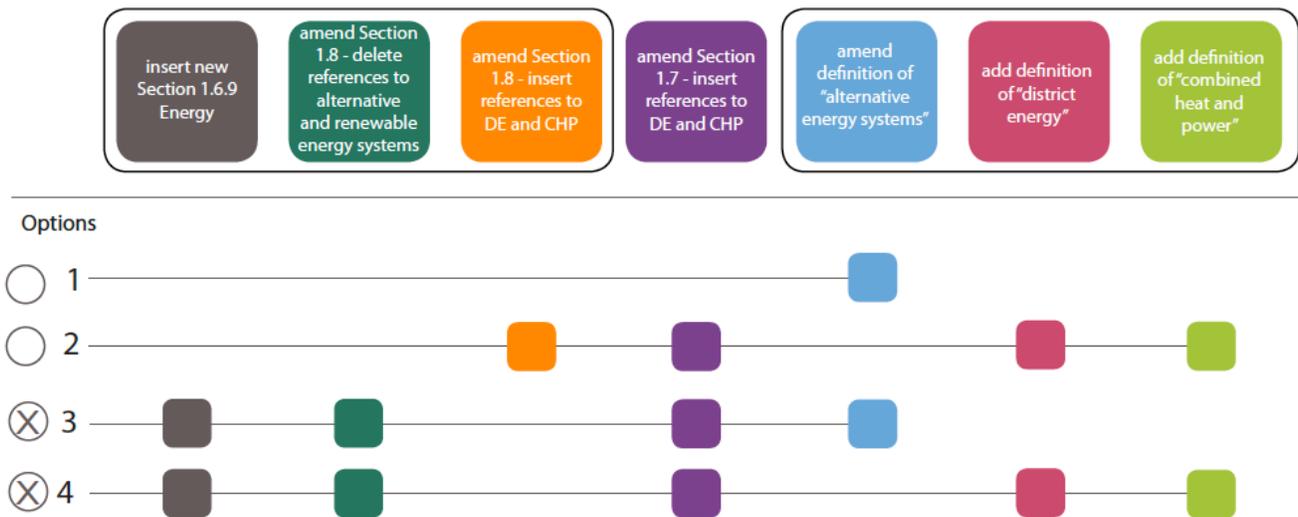


Figure 1. Options for a district energy in the PPS

Option 1. Amend the Definition of "Alternative Energy Systems"

If the intention is that district energy systems (running on any type of fuel, including natural gas) be included under the catchall "alternative energy systems", the definition should be amended to make that intention clearer. For example, the definition could be amended as follows (orange indicates new text):

"Alternative energy systems: means sources of energy, ~~or~~ energy conversion processes, or energy generation facilities and distribution networks that significantly reduce the amount of harmful emissions to the environment (air, earth and water) when compared to conventional energy systems. Alternative energy systems include, but are not limited to, district energy and combined heat and power (also known as cogeneration).

If the definition is amended, no further amendments to the PPS would be necessary, since district energy would be captured under the "alternative energy systems" policies provided in Sections 1.7 and 1.8. This option is the simplest, in so far as it requires the fewest number of amendments to the PPS. It is also effective in clarifying that district energy is supported by the Province as an effective strategy for improving energy efficiency. One drawback over Option 2, however, is that it does not introduce the term "district energy" into the actual PPS policies, which may limit its profile as a key ICES strategy.

Option 2. Insert Definitions for District Energy and/or CHP

Instead of, or in addition to, amending the definition for “alternative energy”, new definitions for district energy and combined heat and power could be added to the PPS, with the terms referenced in relevant sections (1.7, 1.8 and 6.0). The benefit of this option is that it would raise the profile of district energy by including the term directly in the body of the PPS, rather than only in the definitions section.

The following definitions are proposed for discussion by the TRCA’s group of stakeholders:

District energy: means systems that generate and distribute primarily thermal energy (heating and/or cooling) at a community scale and in a more efficient manner than centralized energy systems.

Key words:

electrical energy
thermal energy
generation
distribution
community scale
efficient

Other potential words:

emissions
fuel sources

Combined heat and power, also known as cogeneration: means energy systems that capture excess energy that would otherwise be emitted to the environment and redirect that energy for heating purposes, thereby reducing waste and improving the efficiency of energy generation and distribution.

Key words:

capture excess energy
redirect for heating purposes
Improved energy efficiency

Other potential words:

Options 3 & 4. Add a New Energy Section under Section 1.6 Infrastructure and Public Service Facilities

At first glance, there appears to be an opportunity to address energy systems comprehensively under a new subsection 1.6.9, since the components of any energy generation and distribution system are clearly pieces of infrastructure. However, ICES policies are most clearly grouped under Section 1.8, which addresses the multifaceted aspects of ICES, from land use to transportation and energy supply. This current grouping supports an integrated view of how energy supply and demand can be managed at the community level, which is consistent with ICES as a concept. As such, the option of incorporating energy policies under the infrastructure and public service facilities section has not been identified as a preferred option.

Other Considerations

One other option that may be raised by the TRCA's energy stakeholder group is to introduce the term "integrated community energy systems" into the PPS. It is our feeling that this would require a significant restructuring of the PPS (since ICES would necessarily become an underlying concept for many of the existing PPS policies), which would not likely be supported by the Province, particularly since this submission is being prepared long after the official consultation period has ended (the deadline to submit comments was October 29, 2010). Since the PPS already addresses the most relevant components of ICES, with the exception of district energy, this option is not being recommended.

