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COMBINING OUR ENERGIES: INTEGRATED ENERGY SYSTEMS FOR CANADIAN COMMUNITIES

Report of the Standing Committee on Natural Resources

Leon Benoit, MP
Chair

June 2009

40th PARLIAMENT, 2nd SESSION

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THE STANDING COMMITTEE ON NATURAL RESOURCES

has the honour to present its

FOURTH REPORT

Pursuant to its mandate under Standing Order 108(2) the Committee has studied the Contribution of Integrated Approaches for Providing Energy Services in Canadian Communities and has agreed to report the following:

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INTRODUCTION

During the 39th Parliament, the House of Commons Standing Committee on Natural Resources examined different energy issues, mainly related to energy supply. The Committee tabled a report on the oil sands, conducted hearings on the greening of electricity in Canada, and discussed forestry biomass in its report on the forest sector. In this Parliament, the Committee has decided to advance its study of energy issues by examining downstream energy supply and use, particularly at the community level.

Communities represent about 50 percent of Canada's energy use and greenhouse gas emissions.[1] According to Alan Meier, Associate Director of the Energy Efficiency Centre at UC Davis, the choice of energy policies in North America over the last 30 years has been largely influenced by a lack in knowledge and education regarding emerging energy supply and demand issues.[2] Bob Oliver, Executive Director of Pollution Probe, confirms that the current non-integrated approaches "suffer from an inability to respond creatively to energy crises and climate change."[3] Providing the future energy needs of a growing Canadian population in a carbon constrained economy and achieving the federal government's commitment to reduce greenhouse gas emissions by 60 to 70 percent by 2050 are major challenges that cannot be resolved entirely with conventional energy systems.[4]

As Martin Lee-Gosselin, professor at Laval University, explains, contemporary energy efficient products and services offer multiple innovative opportunities that may "resonate with people who are ripe for change…"[5] The integration of these opportunities, in consideration of both energy supply and consumption, is the principal inquiry behind the Committee's study, based on the underlying concept that integrated energy planning is an effective approach to supporting efficient and resilient patterns of energy supply and demand; diversifying economic opportunities; generating employment; reducing greenhouse gas emissions; and establishing more sustainable communities with an improved overall quality of life.[6]

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1 Quality Urban Energy Systems of Tomorrow (QUEST), *Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action,* March 2008, document submitted to the Committee.

2 Alan Meier, Energy Efficiency Centre at Univeristy of California, Davis, and Lawrence Berkeley National Laboratory, *Committee Evidence*, April 2, 2009.

3 Bob Oliver, Pollution Probe, *Committee Evidence*, April 21, 2009.

4 QUEST, *Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action*, March 2008, document submitted to the Committee.

5 Martin Lee-Gosselin, Université Laval and Imperial College London, *Committee Evidence,* March 31, 2009.

6 QUEST, *Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action*, March 2008, document submitted to the Committee.

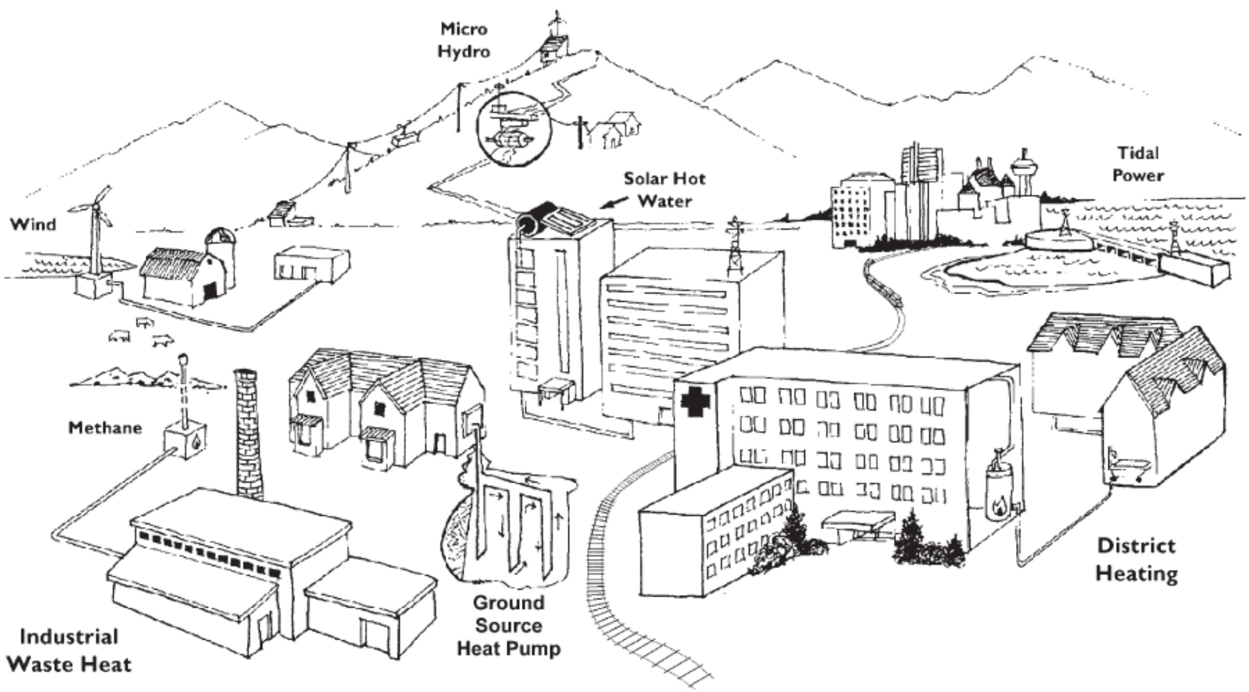
In view of the challenges and opportunities regarding energy management and climate change mitigation, the Committee has conducted a study of integrated energy systems over the course of eight weeks, by hearing from a wide-range of Canadian and international witnesses from the energy industry, academia, and the public and private sectors. This report concludes the Committee's study, and brings forward nine recommendations, based on evidence from a wide-range of expertise.

CHAPTER 1—OVERVIEW

Concept

Energy is traditionally distributed to individual buildings and facilities with little choice over energy sources, and varying energy consumption practices. Substantial inefficiencies can result from this approach, with no use of economies of scale or energy reuse between organizations. Individual leading-edge technologies and practices yield limited impacts by not being integrated.[7]

Figure 1: Possible features of an integrated energy system



Source: *Green Municipalities—A Guide to Green Infrastructure for Canadian Municipalities* prepared for the Federation of Canadian Municipalities (FCM) by the Sheltair Group, May 2001[8].

7 Carol Buckley, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence*, February 26, 2009.

8 QUEST, *Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action,* March 2008, document submitted to the Committee.

An integrated energy system assimilates energy supply and consumption decisions across different community needs (such as heating, cooling, lighting and transport) and sectors (such as land-use, transportation, water, waste management, and industry), by supporting mixed-use development[9], local renewable energy sources, and smart district energy grids for efficient energy management.[10] A few communities in Canada are already applying an integrated approach to energy planning, including energy supply and demand. However, according to Carol Buckley, Director General of the Office of Energy Efficiency, these communities are "fairly rare [because they are attempting] exactly the opposite of the status quo in the way energy [...] is designed and [...] used..."[11]

Benefits and Challenges

By performing bulk purchases and installations at the community level, integrated energy planning has the capacity to support efficiency in land-use and transportation planning, water and waste management, construction, and energy use practices and technologies within buildings.[12] Integrated energy systems also support effective resource management by maximizing energy efficiency and synergy through closed-loop designs (where waste from one area is fuel to another), and by encouraging investment in diverse and flexible energy solutions (including renewable sources), in adaptation to fluctuating energy prices and an uncertain and changing future. The end result would achieve reductions in energy demands/costs and greenhouse gas emissions, gains in local employment and economic development opportunities, and an overall improved and more sustainable quality of life.[13]

The application of integrated energy approaches is challenging due to the large number of individuals and organizations required to carry out integrated community projects, and the underpublicized benefits of such projects. Implementation is often obstructed by the high initial cost of some necessary technologies and infrastructures, and the lack of support from existing regulatory frameworks. For example, according to

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9 Mixed-use development allows for multiple uses within a building or a planning zone. In the context of integrated energy planning, it refers to communities with a combination of land-uses, including commercial, industrial, institutional, and a range of residential land-uses.

10 QUEST, *Collaborating to Promote Integrated Community Energy Systems*, presentation submitted to the Committee, February 26, 2009.

11 Carol Buckley, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence*, February 26, 2009.

12 Ibid.

13 QUEST, *Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action,* March 2008, document submitted to the Committee.

Carol Buckley, “many planning regulations support low-density development and [...] penalize redevelopment in the core of cities,” and in some jurisdictions, local utilities are denied partnership in energy production facilities, which limits their participation and potential financial contribution.[14]

There are numerous short-term benefits and “quick wins” to integrated energy systems, such as immediate energy savings and greenhouse gas reductions. However, other benefits are rather long-term, and their progress is difficult to evaluate due to the lack of standardized measurements and the multiplicity of the mixed uses that require monitoring. Privacy issues emerge where larger blocks of data, at the community level, are required. For example, inquirers often lack access to utility information. The reliability of measurements advances with experience (e.g. through existing and pilot projects), which is still lacking in the area of integrated energy systems.[15]

Jurisdiction and Responsibilities

In his discussion of district energy systems, Douglas Stout, Vice-president of Marketing and Business Development at Terasen Gas, outlined two categories of “players”:[16]

- *enablers*—such as governments, nongovernmental organizations, and energy regulators—who set policies, provide funding, and drive awareness and initiative, and

- *actors*—such as municipalities, developers, private investors, and utility and technology providers—who plan, build, own, operate, and monitor energy systems on the ground.

The *Constitutional Act, 1867* divides the power to make law between “the federal Parliament and the provincial legislatures.” While the Act assigns specific powers to the federal and provincial governments, as shown in table 1, environmental issues involve many areas under different jurisdictions, making the environment an area of shared jurisdiction. Municipalities, strictly speaking, “draw their powers to pass bylaws on environmental matters from the provincial municipal acts that create them and specify their powers to legislate.” However, the Supreme Court of Canada has recently adopted a “purposive interpretive approach, analogous to that used for constitutional interpretation…

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14 Carol Buckley, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence,* February 26, 2009.

15 Kevin Lee, Housing Division, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence,* February 26, 2009.

16 Douglas Stout, Marketing and Business Development, Terasen Gas, *Committee Evidence,* March 5, 2009.

to ensure that municipalities can deal effectively with emergent environmental problems…" As a result of the Court's purposive approach to interpretation, "in addition to municipalities potentially exceeding their powers under provincial municipal acts, their bylaws may also be outside provincial legislative powers under the *Constitution Act, 1867*," and still be valid.[17]

Table 1: Divisions of power between the federal government and the provinces under the *Constitution Act, 1867*

Provincial Powers	Federal Powers
- Management and sale of public lands [s.92 (5)] - Municipal institutions [s.92 (8)] - Property and civil rights [s.92 (13)] - Matters of a local or private nature [s.92 (16)] - Manage and capture revenues from non-renewable and forestry resources and the generation of electrical energy [s.92A – the "1982 resources amendment"] - Public lands, minerals, etc., unless interests are federally owned or the federal government has authority over them (e.g. national parks) [s.109]	- Trade and commence [s.91 (2)] - Taxation power [s.91 (3)] - Navigation [s.91 (10)] - Seacoast and fisheries [s.91 (12)] - First Nations and Aboriginal interests [s.91 (24)] - Criminal law [s.91 (27)] - International negotiation* - General power to make laws for the "Peace, Order and good Government" of Canada
* The *implementation* of an international agreement by the federal government requires constitutional authority or provincial agreement	

Source: Paul Muldoon *et al.*, 2009, p. 21.

Integrated energy planning therefore lies within provincial, territorial and municipal jurisdiction, with particular requirement for provincial engagement given provincial constitutional powers. Federal participation entails contributions through the government's research and funding capacity, experience in establishing national visions and programs (e.g. in energy efficiency, renewable energy, carbon pricing, etc.), and the ability to bring organizations together.[18, 19]

17 Paul Muldoon *et al*. (2009), *An Introduction to Environmental Law and Policy in Canada*, p. 20-23, Emond Montgomery Publications Limited, Toronto.

18 Carol Buckley, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence,* February 26, 2009.

19 Mel Ydreos, Operations, Union Gas Limited, *Committee Evidence*, March 5, 2009.

Municipal (and sometimes regional) expertise is most qualified for setting targets and strategies to address the diverse planning situations across Canada. This emphasizes a bottom-up approach to decision making with respect to community integrated energy planning.[20] Municipalities are involved directly, by establishing energy services (e.g. district energy corporations, poles, wires), and indirectly, by promoting certain forms of development (e.g. high-density, transportation-oriented, etc.). Planners, builders and site-designers assemble the built environment that shapes a community's energy-use patterns.[21]

20 Douglas Stout, Marketing and Business Development, Terasen Gas, *Committee Evidence,* March 5, 2009.

21 Canadian Urban Institute, *Integrated Energy Planning: A Role for Planners and Communities*, document submitted to the Committee, March 26, 2009

CHAPTER 2—CONSIDERATIONS OF INTEGRATED ENERGY PLANNING

Communities vary in size, structure, resources, laws, and opportunities across Canada, leading to a wide array of considerations and no standard approach to integrated energy planning. The following themes present the most prominent and recurrent issues brought forward by witnesses throughout the Committee's study, with varying repercussions for different communities.

Technology

Integrated energy systems entail interconnected rather than individual technologies. The right mix of options and configurations could generate better results than the sum of otherwise individual yields, and go far in supporting more dependable and resilient systems.[22, 23] For example, energy from sources such as wind or solar energy could be used more effectively in conjunction with energy storage technologies to regulate fluctuations in energy supplies and demands.[24] In practice, multiple technologies—both conventional and alternative—are required to deliver the energy requirements of most Canadian communities. A brief selection of alternative technologies illustrates key challenges and opportunities associated with community integrated energy choices.

Small Wind Systems

Wind power in Canada mostly comprises large wind systems (i.e. 80-metre tall turbines for utility scale transmission), which provide about 1 percent of national electricity. For the purpose of integrated energy systems, small wind systems (under 300 kilowatts per turbine) present additional opportunities and different challenges:[25]

1) *Small-sized residential systems* (1-10 kW) cost about $6,000 and provide 10 to 20 percent of household electricity needs in a good wind region. As few as 300 to 400 systems are installed in Canada, mainly due to

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22 Denis Tanguay, Canadian GeoExchange Coalition, *Committee Evidence,* March 24, 2009.

23 Kevin Lee, Housing Division, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence,* February 26, 2009.

24 Joanne McKenna, Distributed Generation Strategy, Customer Care and Conservation, B.C Hydro, *Committee Evidence,* March 5, 2009.

25 Sean Whittaker, Canadian Wind Energy Association, *Committee Evidence,* March 24, 2009.

environmental rather than economic interest. Utilities and governments offer no incentives to recognize the benefits of these systems, and connection costs to the grid often exceed the initial cost of the technology.

2) *Medium-sized commercial and farm systems* (10-100 kW) cost between $180,000 and $200,000, and can provide over 50 percent of the electricity requirements of a medium-to-large dairy farm. There are about 70 to 100 of these systems in Canada, mainly due to the economic investment they represent to many farmers by gaining them independence from the grid. Out of the 10 global manufacturers of these systems, half are Canadian, selling mostly overseas. The benefits of small wind systems are likely to increase with the growing electrification of rural communities in Canada and around the world.

3) *Large wind and wind-diesel systems for remote communities* (50-300 kW). On the island of Ramea, Newfoundland, six 65 kW turbines provide about 80 percent of the population's electricity requirements. In Canada, over 300 northern remote communities rely on diesel generation, which costs anywhere between 25¢ to $1.50 per kilowatt hour (15 times higher than rates in the south) and causes air pollution and diesel spills. Half of the global wind-diesel expertise is Canadian, again, applied mostly overseas. An investment of $51 million could provide about 10 percent of electricity in Canada's north.

There are generally no incentives that recognize the benefits of small wind systems. Aside from their environmental benefits, small wind systems generate local employment opportunities and reduce energy transmission losses due to their proximity to energy demand. Wind is a human-resource intense industry. In Germany, it employs 64,000 people and represents the second largest consumer of steel after the automotive industry. In Canada, the wind industry (mostly large wind) employs about 4,000 people.[26]

Between now and 2020, about $1 trillion dollars will be invested in the wind industry globally, which could further distinguish competitive advantages between global market players.[27]

Heating with Biomass

According to the experience of the Quebec Federation of Forestry Cooperatives, heating institutional buildings directly with forest biomass could produce 15 units of thermal

26 Ibid.

27 Ibid.

energy for one unit of oil (the ratio is 1 to 4.6 for ethanol and 1 to 6 for pellets), which represents “virtually all the energy available from the resource.” Leftover, locally available forest biomass could be exploited, providing an opportunity for communities to support their own needs. An investment of about $1 million per site could install the necessary furnaces and material storage facilities.[28]

Heating with biomass in place of oil has been an important factor behind Sweden’s 7 percent reduction in carbon dioxide emissions. Heat is produced at high enough temperatures such that “all gases are burned and steam emissions and dust levels are very low.” In Quebec, the industry achieved supply costs slightly lower that 3¢ per kilowatt (compared to 8¢ for electricity and over 11¢ for fuel oil) in short supply cycles. For every 500,000 metric tonnes of biomass, one job is created.[29]

“Biomass for [the] institutional heating sector virtually does not yet exist in Canada,” and the technical expertise required to support it is deficient.[30] Biomass can also be used as a renewable source in central district heating, as outlined by the Dockside Green project in Victoria, British Columbia. The project will connect each building to a greenhouse gas neutral biomass district heating system, which uses biomass gasification technology to gasify local waste wood in order to eliminate particulates during combustion.

Geothermal Technology

Thermal energy, which accounts for most energy consumption in Canadian communities, is lost in significant amounts in conventional energy systems. Using geothermal heat pumps, thermal storage and ground heat exchangers, geo-exchange[31] technology represents an opportunity to harness and redistribute a portion of heat losses, thereby raising the overall efficiency of energy systems.[32]

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28 Jocelyn Lessard, Director General, Quebec Federation of Forestry Cooperatives, *Committee Evidence*, March 24, 2009.

29 Ibid.

30 Ibid.

31 Geo-exchange technology can be used for both heating and cooling. Using the earth’s stable ground temperature, the heat-exchange process transfers heat from the ground to the building for heating, and from the building to the ground for cooling. Geo-exchange is usually referred to as “Geothermal Energy,” which more accurately refers to hot springs in Iceland where hot water from naturally occurring hot springs can be run through pipes for heating.

32 Ted Kantrowitz and Denis Tanguay, Canadian GeoExchange Coalition, *Committee Evidence,* March 24, 2009.

Canada's GeoExchange industry underwent unprecedented growth as a result of the Canadian GeoExchange Coalition (CGC) Global Quality GeoExchange Program, which focused on training, accreditation and certification. About 3000 industry stakeholders were trained on Canadian standards and best practices in the past 2 years, and 1000 CGC professionals received accreditation.[33]

Sustained by strong financial incentives in the residential retrofit market, the geo-exchange industry reported at least 50 percent of solid annual growth in each of the past two years, generating a minimum of $250 million in direct economic activity in all of Canada's regions, mostly in the residential sector. Large scale projects in the commercial sector are also increasing steadily reflecting stakeholder awareness to both the benefits of GeoExchange technology and of the CGC Quality Program.[34]

Despite the feasibility and growth of geo-exchange technology, the industry faces a number of market barriers. The standard for geo-exchange installation and design has not been revised since it was developed about 15 years ago, and does not reflect the current reality of geothermal markets. This lack of an up-to-date standard makes it easy for geo-exchange technology to get outlawed at the municipal level in favour of other options with higher standards. Other market barriers are caused by the general disinformation about geo-exchange technology and reluctance to divert from conventional practices; financial issues related to investment timing with capital stock turnover and the lack of adapted financing; supply issues for new technologies and equipment; and shortages in trained labour.[35]

Green Building

In Canada, the operation of buildings generates between 30 and 35 percent of greenhouse gas emissions (48 percent if building material is to be included). Two noteworthy building approaches apply an integrated design strategy, using various conservation and efficiency principles (e.g. climate-responsive design; heat and drain water recovery; and healthy building material):

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33 Supplementary information provided by Denis Tanguay, May 11, 2009.

34 Ibid.

35 Ted Kantrowitz and Denis Tanguay, Canadian GeoExchange Coalition, *Committee Evidence,* March 24, 2009.

- *The Net-Zero Energy Home Approach* targets designs that produce "at minimum, an annual output of renewable energy that is equal to the total amount of its annual consumed/purchased energy from energy utilities." [36] Net-zero homes are "grid-tied," establishing homeowners as both energy consumers and producers.[37]

- *The Leadership in Energy and Environmental Design (LEED) Standards*. Canada's first platinum-certified building, at the Parks Canada Gulf Island Park Reserve, uses one-quarter the energy of a similar conventional building and saves 32 tonnes of greenhouse gas emissions annually. LEED certified projects cost between 3 to 4 percent more than conventional buildings, with a payback period averaging between 3 and 5 years, depending on the energy prices in a given year. LEED are unregulated, voluntary standards.[38]

The cost of energy efficient building will decline as the availability of technologies increases and builders become more familiar with efficiency and conservation principles.[39] Retrofitting represents greater opportunities than new-building since only about 3 percent of building stock changes in Canada annually.[40] It is however less expensive to build new than to retrofit existing buildings.[41]

Smart Grids

A smart grid is a series of initiatives brought about by various organizations to bring together elements of the electricity system (i.e. production, delivery, and consumption) closer in order to improve the overall system operation, and facilitate the integration of distributed generation, renewable energy sources, and energy storage technologies. For example, smart grids could offset variability in renewable energy production (e.g. periods of excess or low wind production relative to demand), activate demand responses when supply is insufficient, and reduce congestion on transmission and distribution lines. Smart grid technology has the capacity to anticipate and address problems before they lead to outages, and allow consumers to control their electricity use in response to price-changes and other parameters, thereby promoting energy efficiency

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36 *Canadian Net-Zero Energy Homes: An Integrative Path to Cleaner Energy and a Healthier Environment*, Presentation presented to the Committee, April 2, 2009.

37 Gordon Shields, Net-Zero Energy Home Coalition, *Committee Evidence,* April 2, 2009.

38 Thomas Mueller, Canada Green Building Council, *Committee Evidence,* March 10, 2009.

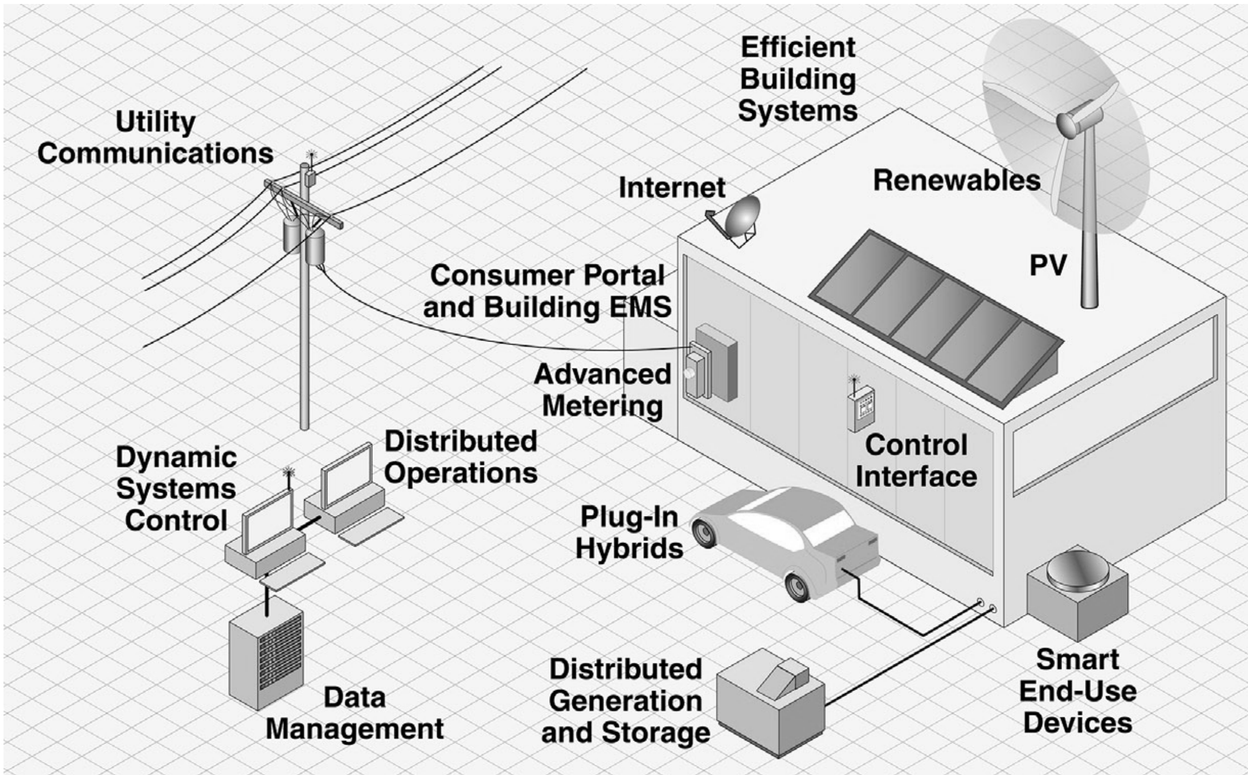
39 Gordon Shields, Net-Zero Energy Home Coalition, *Committee Evidence,* April 2, 2009.

40 Michael Harcourt, Quality Urban Energy Systems of Tomorrow, *Committee Evidence,* February 26, 2009.

41 Gordon Shields, Net-Zero Energy Home Coalition, *Committee Evidence,* April 2, 2009.

and conservation. According to Gridwise, a U.S.-based alliance of electricity stakeholders, "a $16 billion investment over the next four years would trigger smart grid projects worth $64 billion [and create] 420,000 direct and indirect jobs."[42]

Figure 2: Smart grid illustration



Source: Electric Power Research Institute.

Smart grids are still in their infancy, and their development requires a multiplicity of technologies with different costs and potentials for commercialization. Moreover, enabling the exchange of information between new and existing technologies is a "substantial" technical challenge, as pointed out by the Ontario Smart Grid Forum.[43] According to

42 *Enabling Tomorrow's Electricity Systems: Report of the Ontario Smart Grid Forum* (2009), report submitted to the Committee.

43 Ibid.

Joanne McKenna of BC Hydro, smart grid technologies "are all in the future… potentially 10 to 20 years out." Nevertheless, Ms. McKenna points out that current community planning must account for such futuristic developments.[44]

Land-Use and Infrastructure

In Canada, the layout of most communities, which is an integral factor in determining energy-use patterns, materializes in "cookie-cutter" plans according to development and building codes, property taxation, and land-use zoning. Conventional practices lead to inefficiencies in both energy supply and demand. For example, more distant electricity supply sources result in larger losses in energy transmission, and buildings are typically bound to the role of "energy consumers" and do not often contribute to energy supply. Alternative combinations are difficult to achieve with conventional planning.[45]

Many communities, including small towns, provide a context for shared systems and conservation opportunities, with the exception of residential suburban and rural sprawls.[46] According to Thomas Mueller, President of the Canada Green Building Council, per capita greenhouse gas emissions from Canadian cities rank higher than their European counterparts, mainly due to Europe's generally more compact and integrated urban structures.[47] Penny Ballem of the City of Vancouver confirms that compact, mixed-use planning enables public and active transportation[48] and justifies the economics of district heating and renewable district energy systems.[49] The sprawl of urban regions is a central contributor to inefficiencies in energy supply and demand patterns and to greenhouse gas emissions.[50]

The existing regulatory framework of most communities is a hindrance to integrated land-use and energy planning. According to Christopher Bataille, Director of M.K. Jaccard and Associates Inc., property taxation systems favour sprawl over intensification by not accounting for the added costs of low-density housing (i.e. sewers, water pipes, and

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44 Joanne McKenna, Distributed Generation Strategy, Customer Care and Conservation, B.C Hydro, *Committee Evidence,* March 5, 2009.

45 Bob Oliver, Pollution Probe, *Committee Evidence,* April 2, 2009.

46 Kevin Lee, Housing Division, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence,* February 26, 2009.

47 Thomas Mueller, Canada Green Building Council, *Committee Evidence,* March 10, 2009.

48 Active transportation refers to any form of human-powered transportation, such as walking, cycling, skating, canoeing, etc.

49 Penny Ballem, City of Vancouver, *Committee Evidence,* March 12, 2009.

50 Christopher Bataille, M.K. Jaccard and Associates Inc., *Committee Evidence,* March 31, 2009.

electricity infrastructure).[51] Glen Murray, President of the Canadian Urban Institute, reiterated the same view, adding that supporting low-density, unserviced developments—which are also less economical to service—undermines the competitive advantage of high-density, mixed-use districts, and by extension, the feasibility of integrated energy systems. In New Zealand, property taxation encourages taller building and retrofit projects by taxing lands and collecting unit charges on services, while leaving buildings "virtually untaxed."[52]

Other recurrent issues confronting integrated energy planning include "unclear" provincial policies and standards; federal stimulus packages that target specific technologies and require "de-bundling" when applied to integrated projects; and monopoly issues with utility companies that discourage connecting individual power sources to the grid.[53]

Economic Considerations

As pointed out by Atif Kubursi (Economics Professor at McMaster University), integrated energy systems result in direct, indirect and induced economic impacts that should be analysed in consideration of numerous factors and consequences, including capital expenditure, avoided costs, the creation of employment opportunities, induced investements, etc. For example, a study prepared for the Ontario Power Authority demonstrates that conservation savings represent avoided costs that could be reinvested in the economy through general consumption when realized by consumers, and through increased investments when realized by businesses. These investments would in turn stimulate employment opportunities. As figure 3 illustrates, an economic impact analysis of four elements of an integrated energy system (energy efficiency, demand management, fuel switching, and customer based generation) shows that the sum of equipment and program costs (front) and total avoided costs (back) yield a positive net avoided cost (middle).[54]

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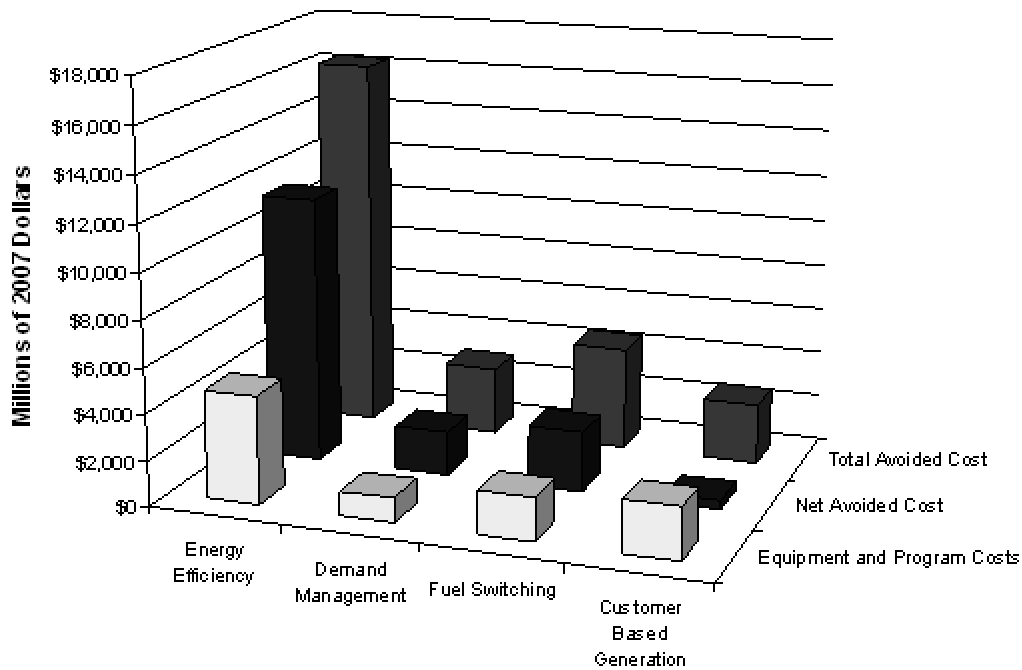
51 Ibid.

52 Glen Murray, Canadian Urban Institute, *Committee Evidence,* March 26, 2009.

53 Karen Farbridge, City of Guelph, *Committee Evidence,* March 12, 2009.

54 Atif Kubursi, McMaster University, *Committee Evidence,* March 31, 2009.

Figure 3: Avoided costs, equipment and program costs of conservation programs



Source: *Economic Impact Analysis of Integrated Energy Systems,* presentation by Atif Kubursi presented to the Committee, March 31, 2009.

Despite the inherent economic benefits of conservation and efficiency, the financial viability of an integrated energy system depends on the cost and integration of available technologies. From a pure economic standpoint, the initial cost of some leading-edge technologies may be too high in the short-term, especially since capital cost tends to rise with efficiency.[55] For municipalities, where capital and operating budgets are separate, payback time is a particular challenge since savings on capital expenditure to purchase inefficient technologies would always be at the expense of costly life-cycle operations from a different budget and visa-versa.[56] While some technologies are closer to commercialization than others, the right combinations of options could reduce the total payback period.[57]

To facilitate the implementation of integrated energy systems, carbon pricing has been referred to by witnesses as a mechanism to encourage low-emission technologies. Jamie James argued that assigning a value to carbon would urge the private sector to add incremental financing to green projects which could advance the development of integrated

55 Glen Murray, Canadian Urban Institute, *Committee Evidence,* March 26, 2009.

56 Ibid.

57 Denis Tanguay, Canadian GeoExchange Coalition, *Committee Evidence,* March 24, 2009.

energy systems. Jonathan Westeinde also supported the mechanism by outlining its potential to level the playing field and create a competitive landscape for both energy conservation and renewable energy sources, as observed in the European Union.[58]

Tim Weis argued that given the diverse provincial energy policies across Canada, the mechanism would yield unequal benefits in different regions of the country. For example, in provinces such as Quebec and British Columbia, where low-emission hydro power is already predominant, the development of other renewable energy technologies would require additional incentives.[59] Alan Meier added that getting the price right is crucial. If the carbon price is too low, it would result in lower effects on renewable energy than recently observed fluctuations in energy prices.[60] According to Glen Murray, an effective carbon pricing system must be part of a broader policy framework that includes cap and trade.[61]

Employment and Training

The diverse labour demands of integrated energy systems present a wide range of employment opportunities. In British Columbia, for example, the Energy Efficient Buildings Strategy is projected to create about 10,000 new jobs per year over 12 years (excluding re-spending due to efficiency savings), and a preliminary analysis of BC Hydro's Distributed Generation projects estimates between 5,000 and 15,000 potential employment opportunities over 10 years through:[62]

- *Direct impacts*: onsite (e.g. construction, management, etc.) and offsite (e.g. fuel/fleet management, offsite assembly, equipment suppliers, etc.)
- *Indirect Impacts*: in supporting businesses (e.g. bankers, contractors, manufacturers, etc.)
- *Induced Impacts*: due to spending on goods and services (e.g. groceries, child care, etc.)

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58 Jamie James and Jonathan Westeinde, Windmill Development Group Ltd., *Committee Evidence,* March 12, 2009.

59 Tim Weis, Pembina Institute, *Committee Evidence*, March 24, 2009.

60 Alan Meier, Energy Effciency Centre at Univeristy of California, Davis, and Lawrence Berkeley National Laboratory, *Committee Evidence*, April 2, 2009.

61 Glen Murray, Canadian Urban Institute, *Committee Evidence*, March 26, 2009.

62 *Written Response from BC Hydro to a Question*, document submitted by BC Hydro to the Committee. The exact quote is: "Creation of about 130,000 person years of new employment over 12 years, excluding consumer re-spending of funds saved through energy efficiency measures."

The lack of trained labour is a human resource challenge for the green building industry. As pointed out by Andrew Pride of the Minto Group, “there's a real lack of capacity in the [green building] industry today to provide the necessary equipment and the necessary labour to build high-performance buildings.”[63] Shortages in skilled workers also challenge the renewable energy sector, as illustrated by the Geoexchange Coalition which actively trains numerous industry stakeholders to meet the rapidly growing demand for geothermal energy systems. According to Elizabeth McDonald, the deployment of sustainable technologies or renewable energy generates economic activity by creating long-term local employment.[64]

Federal Programs

Natural Resources Canada undertakes a number of initiatives to advance community integrated energy planning, including:[65]

- Research and development (e.g. on technologies such as solar storage systems);
- A joint federal, provincial and territorial initiative to develop a cross-Canada “road map” of policies and programs with potential to support integrated energy approaches, and to think of ways to address the barriers facing areas in most need of additional support. The road map would act as a “guide” to communities of all sizes on how best to approach integrated community solutions in their different circumstances;
- A plan to develop a standard way to measure community-level energy use across 12 Government of Canada departments.

The Government of Canada supports a number of individual technologies and practices through the ecoENERGY Program (e.g. renewable heating, building retrofit, and renewable energy), although it is unclear how these individual subsidies would benefit integrated energy approaches and technologies.[66] The government also granted $550 million to the Federation of Canadian Municipalities to establish the Green Municipal

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63 Andrew Pride, Minto Green Team, Minto Group, *Committee Evidence,* March 26, 2009.

64 Elizabeth McDonald, Canadian Solar Industries Association, *Committee Evidence*, April 2, 2009.

65 Carol Buckley and Kevin Lee, Office of Energy Efficiency, Department of Natural Resources, *Committee Evidence*, February 26, 2009.

66 Mel Ydreos, Operations, Union Gas Limited, *Committee Evidence*, March 5, 2009.

Fund, which supports some integrated energy projects (e.g. community energy planning and district heating) through “below-market loans and grants, as well as education and training services.” Demand for the Fund across Canada exceeds the program’s limited resources.[67]

Throughout the Committee’s study, witnesses have suggested numerous approaches to improving existing federal policies and programs in order to make them more applicable to integrated energy systems. In particular, there has been a distinction between integrated funds such as the Green Municipal Fund and technology-specific subsidies as applied by the ecoEnergy program. The vast majority of witnesses indicated that technology-specific subsidies are difficult to use in an integrated energy context, mainly due to their limited flexibility.

67 Eamonn Horan-Lunney, Intergovernmental Relations, Federation of Canadian Municipalities, *Committee Evidence*, March 10, 2009.

CHAPTER 3—LESSONS LEARNED: CASE STUDIES

There are a number of integrated energy projects currently underway in various communities across Canada:[68]

- The Town of Vermilion, Alberta (population 3,744) is examining “an innovative approach to solid waste management that will produce power using animal and municipal organic wastes as bio-energy.” The project is expected to reduce greenhouse gasses by the equivalent of “at least 9,000 tonnes of carbon dioxide.”

- The City of Revelstoke, British Columbia (population 8,047) will build a “heating plant that will combust approximately 7,000 tonnes of wood biomass residue annually… to provide hot water and heat to several buildings across the city.” The project is expected to result in a “net 40 to 60 percent process efficiency improvement” in energy capture, transmission and delivery, which would also reduce greenhouse gases by 4,157 metric tonnes annually.

- The Municipality of the District of West Hants, Nova Scotia (population 13,780) will conduct “energy audits of its central administrative building, water treatment plant and waste water treatment plant,” in addition to extensive assessments of energy conservation and efficiency solutions. The study is expected to trigger capital projects that will reduce energy consumption by 20 percent.

- The City of Senneterre, Quebec (population 3,488) plans to establish a “receiving station—a thermal park—to capture thermal waste heat from the Boralex-Senneterre cogeneration unit for use by agricultural, agri-food and agri-industrial production and processing companies” in the form of hot water. The system is expected to reduce water consumption at the cogeneration plant, and achieve about 91 percent reductions in greenhouse gas emissions.

- The Town of Quispamsis, New Brunswick (population 13,521) will “conduct a detailed energy audit and create a local action plan for its municipal facilities and vehicle fleet.” The town estimates about

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68 As described by the Federation of Canadian Municiplaities’ document *Integrated Energy Systems in Small and Rural Municipalities* (March 25, 2009), submitted to the Committee.

826 tonnes of greenhouse gas reductions by 2011 (a 20 percent decrease from 1994 levels).

Each of the following case studies highlights a lesson learned in practice through the planning or implementation of an integrated energy system. When brought together, the highlighted themes, which are indicated in the title of each section, represent fundamental factors to advancing integrated energy systems.

Integration: City of Guelph Community Energy Plan

In 2007, the City of Guelph (Ontario) adopted a community energy plan brought forward by private, non-profit and public sector organizations with goals to develop integrated community services (i.e. water, energy, transport, etc.); reduce per capita greenhouse gas emissions below the current global average; reduce per capita energy and water use below comparable cities in Canada; and establish the city as a "location of choice for investment." Initial assessments of the city's efficiency and renewable energy strategies fell short of the desired targets, which led to a more integrated strategy by considering local generation and district energy systems. Community projects developed in line with the multi-utility aspects of the city's plan by incorporating cogeneration, district energy, and an integrated energy master plan.[69]

Still in its planning phase, the case of Guelph illustrates that the integration of expertise, planning and technologies is a fundamental principal in the implementation of integrated energy systems.

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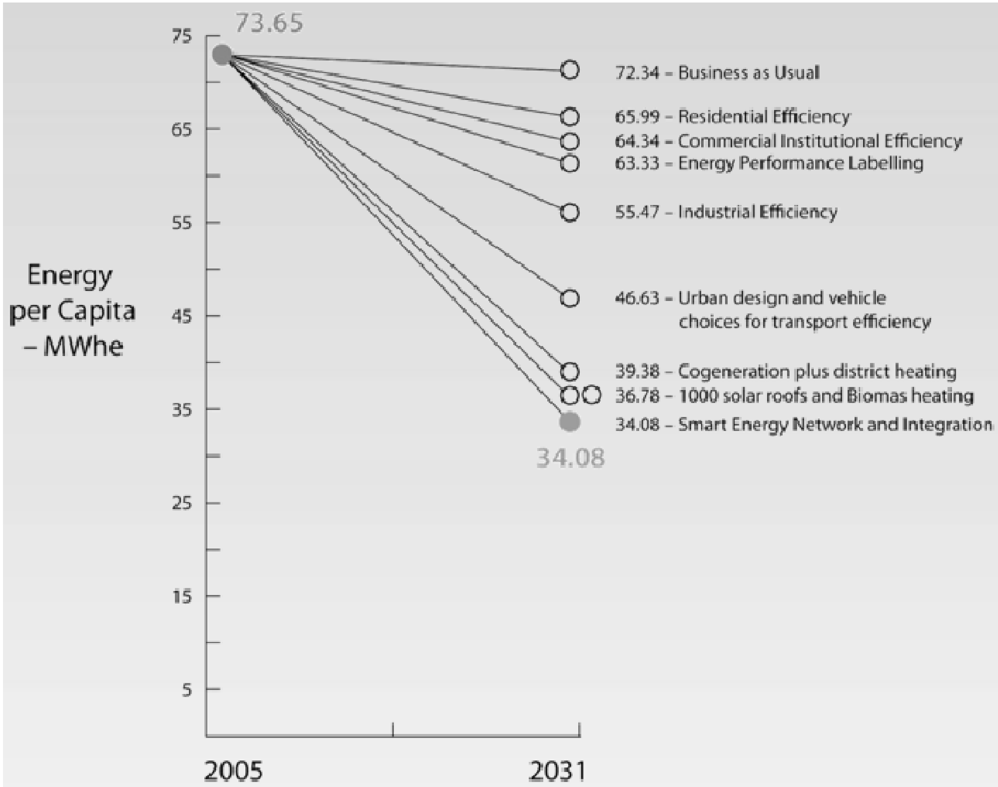
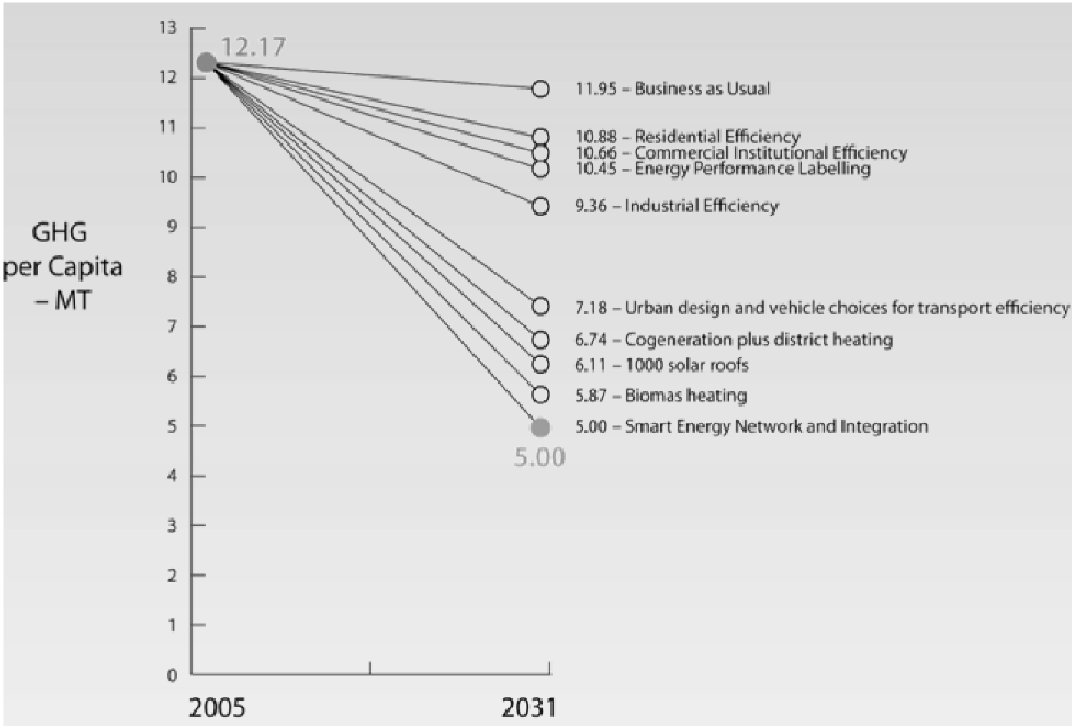
69 Karen Farbridge, City of Guelph, *Committee Evidence,* March 12, 2009.

Figure 4: Cumulative contribution of energy reduction strategies per capita



Source: City of Guelph.

Figure 5: Cumulative contribution of greenhouse gas reduction strategies per capita



Source: City of Guelph.

Local Resources: Town of Two Hills' Anaerobic Digester

Anaerobic digestion is a waste management approach that produces energy and can recover natural resources. At the Town of Two Hills (Alberta), the resource potential of feedlot manure triggered a lab-scale anaerobic digestion pilot plant which was very successful and eventually grew into a $100 million commercial-scale project. The project grew to incorporate a regional-scale ethanol production facility in addition to the feedlot and the digester. These three elements form an integrated closed-loop production cycle, where by-products from one process become an input resource to the next. The project's economic and environmental advantages have benefits for the entire community.[70]

70 Shane Chrapko and Trevor Nickel, Growing Power Hairy Hill LP, Town of Two Hills, *Committee Evidence,* March 26, 2009.

The case of Two Hills demonstrates that communities can achieve great gains by realizing the potential of their local resources. By effectively managing these resources, production and waste management processes can be integrated into self-sufficient closed-loop cycles.

Municipal Authority: Southeast False Creek, Vancouver

Vancouver's Southeast False Creek development (home of the Olympic Village) is a 6 million square feet compact mixed-use brownfield development that incorporates green buildings, renewable district heating, and a sustainable transportation system. The Green Building Strategy is supported by Vancouver's land-use and building codes and bylaws, which is an exceptional situation, given that municipalities in Canada rarely control their own building codes. By planning for compact, mixed-use development, the Strategy enables public and active transportation, facilitates efficient building systems, and justifies the economics of district heating and renewable district energy systems. The buildings are designed to integrate with transportation by providing dedicated charge points for electric vehicles. In addition, public transit is undergoing electrification, with plans to reintroduce street cars to Vancouver.[71]

The case of Southeast False Creek illustrates how municipal authority (in this case through independent land-use and building codes) could play a central role in advancing some elements of integrated energy planning.

Government Funding: Drake Landing Solar Community, Okotoks

The objective of the Drake Landing Solar Community Pilot Project in Okotoks (Alberta) is to demonstrate how the integration of energy-efficient technologies using seasonal solar thermal energy storage could provide 90 percent of a home's annual space-heating requirements. With 52 homes at the community, a district heating system stores excess solar energy in the summer to supplement space-heating needs in the winter, and provide 60 percent of hot water requirements year-round. The project added $7.1 million (over $136,000 additional per home) to the development's initial capital cost, which was only feasible due to financial incentives from the federal and provincial governments. The project is the world's first application of single-family solar storage technology at the community level.[72]

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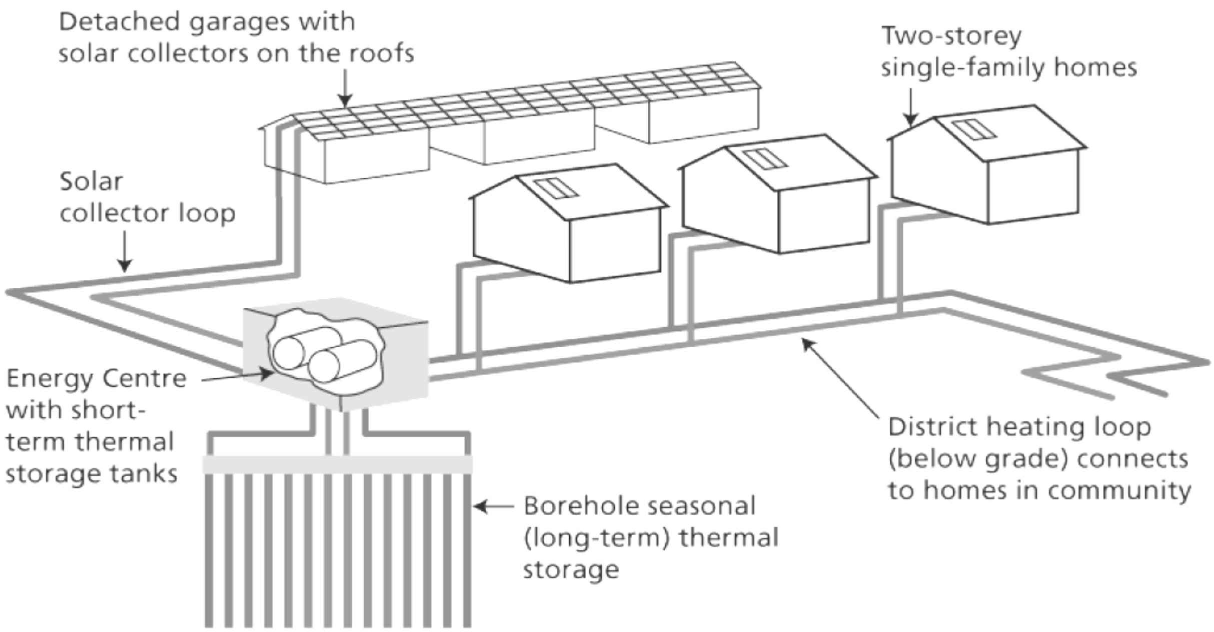
71 Penny Ballem and Sean Pander, City of Vancouver, *Committee Evidence,* March 12, 2009.

72 Brendan Dolan, ATCO Gas, Drake Landing Solar Community, *Committee Evidence,* March 12, 2009.

Large-scale research and development projects come with inherent unknowns (e.g. costs, operations, maintenance, expertise, reliability and longevity) and high risk, which tends to discourage private investment and consumer participation. The case of the Drake Landing Solar community illustrates that government funding is a requisite for the success of such large-scale pilot projects.[73]

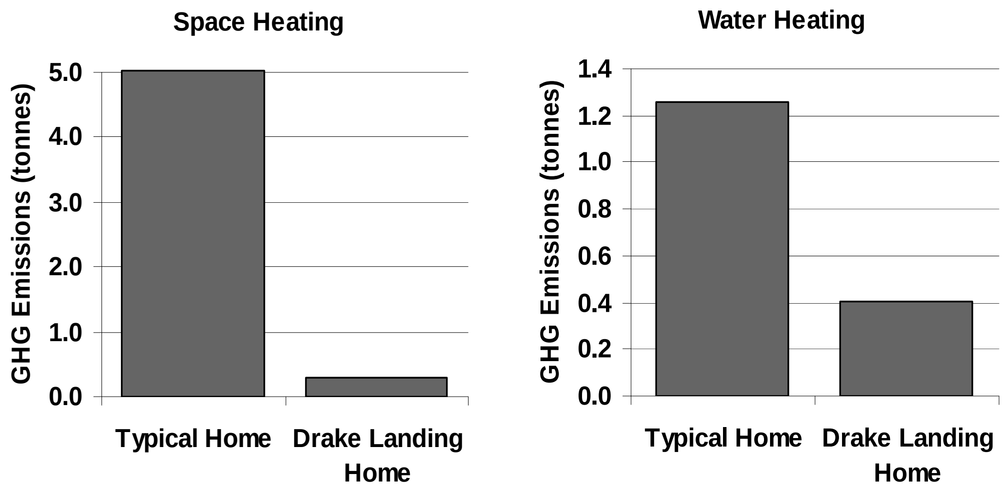
Figure 6: Drake Landing Solar Community Setup



Source: ATCO Gas, document presented to the Committee.

73 Ibid.

Figure 7: Drake Landing greenhouse gas reductions from space and water heating



Source: ATCO Gas, document presented to the Committee.

Financial Management: Énergie Verte Benny Farm, Montreal

Énergie Verte Benny Farm (EVBF) is a non-profit, community-owned energy company that was created to implement and manage the Greening the Infrastructure at Benny Farm project in Montreal. The project "integrates a range of energy and water systems between and within [...] buildings" using various conservation technologies. With initial investments aided by about $3 million from the Federation of Canadian Municipalities' Green Municipal Fund, the project is expected to eliminate 313 tonnes of greenhouse gas emissions, conserve 6,700,000 litres of potable water, and divert approximately 15,200,000 litres of waste water annually. These achievements will reduce the energy costs during the life-cycle of the project. EVBF will charge 75 percent of the market energy rate to ensure "manageable bills… [and] engage in other community education and energy projects."[74]

The experience of EVBF illustrates that high initial capital and management costs (e.g. design, technology, expertise, etc.) can be long-term investments with economic advantages spanning the lifecycle of an integrated energy system. This is particularly

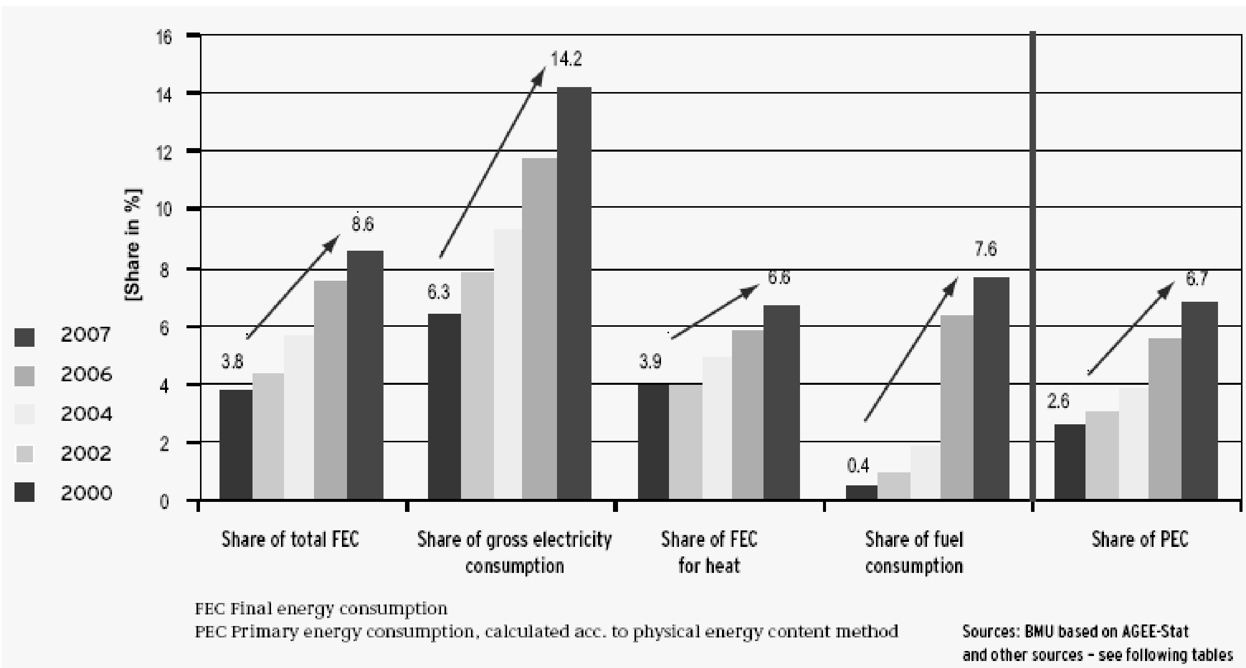
74 Alex Hill, Green Energy Benny Farm, *Committee Evidence*, March 26, 2009.

relevant in the context of rising energy costs. As Daniel Pearl puts it: “when affordable housing is no longer affordable because energy costs are higher than inflation, then the people living in the project no longer can live in the project.”[75]

Incentive: Germany and Sweden

In spite of its relatively scarce natural resources (both fossil fuels and renewable), Germany’s renewable industry is a world leader, employing 250,000 people, reducing the energy sector’s carbon dioxide emissions by one seventh, and adding a total turnover of about 25.5 billion Euros to the country’s gross domestic product. The industry continues to grow despite the current economic crisis.[76]

Figure 8: Renewable energy sources as a share of energy supply in Germany



Source: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany), *Renewable Energy Sources in Figures*, p.11, document submitted to the Committee.

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75 Daniel Pearl, L’Office de l’éclectisme urbain et fonctionnel (L’OEUF), *Committee Evidence*, March 26, 2009.

76 Christine Wörlen, Arepo Consult, Germany, *Committee Evidence*, April 23, 2009.

To counteract initial public rejection of wind energy, project developers organized an outreach program, selling wind park shares to local communities. As stakeholders, the previously disturbing "fluctuating shadows and noise... [turned into the sound of] money [...] being generated..."[77] In addition, the following policy incentives were introduced:[78]

- A feed-in tariff system guaranteeing a certain rate for each kilowatt hour's production (several improvements to feed-in policies were introduced in 2000 and 2004, which advanced renewable energy production as illustrated in Figure 9);
- Requirement of transmission system operators to buy all renewable energy production;
- A built-in annual reduction of tariffs to encourage early action;
- Government guidance to the public on technical details.

Germany is also a net exporter of electricity and a net importer of resources (i.e. fossil fuels and uranium), which makes it more attractive politically and economically to develop renewable energy further. The government continues to discuss ambitious goals of up to 50 percent renewable production by 2030. However, the feasibility of such continued rapid expansion is unclear, considering current issues with integrating electricity production to the grid. Future technologies may resolve such technical difficulties.[79]

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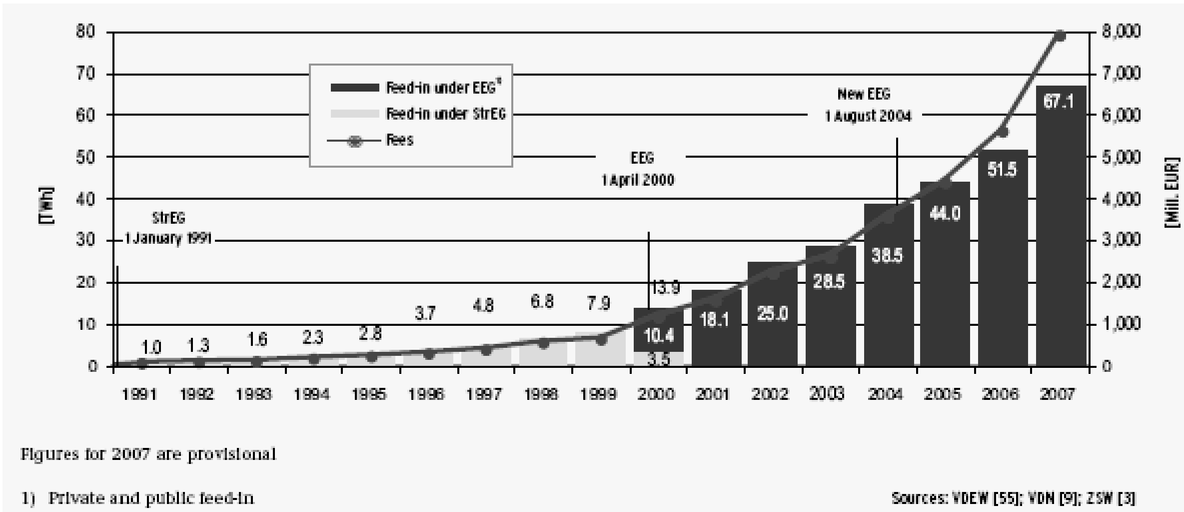
77 Ibid.

78 Ibid.

79 Ibid.

Figure 9: Feed-in and fees under the act on the sale of electricity to the grid and the Renewable Energy Sources Act



Source: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany), *Renewable Energy Sources in Figures*, p.32, document submitted to the Committee.

In Sweden, the development of district heating dates back 60 years. In the 1950s, major Swedish cities decided to replace their individual oil boilers with district heating for environmental reasons. By the 1970s, the two oil price peaks created enough incentive for even smaller cities to invest in district heating systems in order to reduce their dependence on oil. A politically-driven expansion of district heating continued throughout the 1980s, where “heating plans” provided a regulatory framework by specifying planned areas for district heating development. Today, district heating companies operate in an unregulated market, in competition with other heating systems.[80]

According to Peter Öhrström, the contribution of fossil fuels to heating dropped from 87 percent in 1981 to 12 percent in 2007, which reduced carbon dioxide emissions by over 80 percent. In the same period, biomass increased from 0 to 45 percent, incineration increased from 5 to 16 percent, and industrial waste heat increased from 3 to 7 percent. The system’s reliance on local resources has been beneficial, especially given the long distances between Swedish cities and villages.[81]

80 Peter Öhrström, Ortelius Management AB, *Committee Evidence,* April 23, 2009.

81 Ibid.

As the cases of Germany and Sweden illustrate, incentive creates a context for change. Integrated energy systems demonstrate economic foresight and diversification. They allow communities across Canada to establish self-governing local economies by observing today's resources and technology potentials and by investing in tomorrow's needs. The successful implementation of integrated energy systems requires that all levels of government, utility companies, private investors, developers, and citizens contribute within their areas of responsibility.

CHAPTER 4— TOWARDS AN INTEGRATED ENERGY VISION FOR CANADIAN COMMUNITIES: RECOMMENDATIONS

The role of the federal government is to solely provide information and resources to enable communities to implement best practices and share expertise on energy planning matters. Given that energy lies mostly within provincial, territorial and municipal jurisdiction, all solutions must be carried out cross-jurisdictionally, in collaboration with the provinces and territories.

Recommendation 1

The Committee recommends that the federal government, in cooperation with the provinces, territories and municipalities, formulate a definition of integrated energy systems that would establish the necessary vision and leadership for integrated energy systems as a community planning model. The vision would respect the jurisdiction of the provinces and territories and recognize the fundamental role and responsibility of municipalities in designing, implementing, and managing their own community-specific integrated energy plans and projects.

Recommendation 2

To promote collaboration and information-sharing on integrated energy planning, the federal government must work with provincial and territorial governments, as well as consumers, communities and key stakeholders of energy systems.

The Committee therefore recommends that the federal government establish dialogue between the provinces and territories on potential policy initiatives to advance integrated energy systems across Canada (e.g. feed-in tariffs and guarantees that local energy production is purchased by utility providers).

The Committee also recommends that the government provide information and educational material to consumers, communities, and key stakeholders, including practical and technical energy planning advice for different regions, based on the findings of the "road map" initiated by Natural Resources Canada.

Recommendation 3

To improve the effectiveness of existing stimulus packages, the Committee recommends that the Government of Canada consider the introduction of an *ecoENERGY Program* for integrated energy projects, and review existing ecoENERGY programs as potential sources of funding for the new program.

Recommendation 4

The Committee acknowledges the concerns of rural and remote communities that rely on diesel for their energy supply and recommends that the Government of Canada review its ecoENERGY program to include integrated hybrid systems for rural and remote communities.

Recommendation 5

The Committee recommends that the Government of Canada consider the introduction of direct rebates and tax incentives to integrated energy technologies with the goal of introducing and fostering low-emission technologies and reducing energy demand.

Recommendation 6

The Committee recommends that the Government of Canada review and update existing federal standards and practices related to renewable energies in consideration of current market realities and ground-level challenges facing integrated energy planning, keeping in mind provincial and municipal jurisdictions.

Recommendation 7

The Committee recommends that the Government of Canada work with the Provinces, the Territories and stakeholders to address the issue of labour shortages with regards to integrated energy technologies.

Recommendation 8

In order to facilitate the implementation of integrated energy systems, the Committee recommends that the Government of Canada consider carbon pricing as an important mechanism to create and foster low-emission technologies.

Recommendation 9

The Committee recommends that Natural Resources Canada continue working on enabling reliable measurement of energy use within communities.

APPENDIX A

Principles that Guide Sustainability in Urban Energy Systems[82]

1) Efficiency: reduce the required energy input for a given service.

2) Energy optimization: avoid the use of high-quality energy in low-quality applications.

3) Heat management: exploit all feasible thermal energy.

4) Waste reduction: exploit all available resources (e.g. landfill gas, gas pressure drops, and municipal, agricultural, industrial and forestry wastes).

5) Renewable resources: make use of local biomass, geothermal, hydro, solar and wind energy.

6) Strategic use of grids: optimize the use of energy within the grid.

82 QUEST, *Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action,* March 2008, document submitted to the Committee.

APPENDIX B
LIST OF WITNESSES

Organizations and Individuals	Date	Meeting
Department of Natural Resources	2009/02/26	5
Carol Buckley, Director General, Office of Energy Efficiency		
John Marrone, Director General, CANMET Energy Technology Centre - Ottawa		
Kevin Lee, Director, Housing Division, Office of Energy Efficiency		
Quality Urban Energy Systems of Tomorrow		
Michael Harcourt, Chairman		
Kenneth Ogilvie, Representative, Environmental Organizations		
Michael Cleland, Representative, Industrial Organizations		
B.C. Hydro	2009/03/05	7
Joanne McKenna, Project Manager, Distributed Generation Strategy, Customer Care and Conservation		
Victoria Smith, Manager, Aboriginal and Sustainable Communities Sector, Key Account Management		
Terasen Gas		
Douglas Stout, Vice-president, Marketing and Business Development		
Union Gas Limited		
Mel Ydreos, Vice-President, Marketing		
Canada Green Building Council	2009/03/10	8
Thomas Mueller, President and Chief Executive Officer		
Federation of Canadian Municipalities		
Andrew Cowan, Senior Manager, Knowledge Management Unit		
Eamonn Horan-Lunney, Manager, Intergovernmental Relations		

Organizations and Individuals	Date	Meeting
City of Guelph	2009/03/12	9
Karen Farbridge, Mayor		
Janet Laird, Director, Environmental Services		
Jasmine Urisk, Director, Guelph Hydro		
City of Vancouver		
Sean Pander, Program Manager, Climate Protection		
Penny Ballem, City Manager		
Dockside Green		
Jamie James, Representative, Partner, Windmill Development Group Ltd		
Jonathan Westeinde, Representative, Partner, Windmill Development Group Ltd		
Drake Landing Solar Community		
Brendan Dolan, Representative, Vice President, ATCO Gas		
Shahrzad Rahbar, Representative, Vice-President, Canadian Gas Association		
Canadian GeoExchange Coalition		
Denis Tanguay, President and Chief Executive Officer	2009/03/24	10
Ted Kantrowitz, Vice-President		
Canadian Wind Energy Association		
Sean Whittaker, Vice-President, Policy		
Pembina Institute		
Tim Weis, Director, Renewable Energy and Efficiency		

Organizations and Individuals	Date	Meeting
Québec Federation of Forestry Cooperatives	2009/03/24	10
Jocelyn Lessard, Director General		
Brigitte Gagné, Representative, Executive Director, Conseil canadien de la coopération		
Benny Farm	2009/03/26	11
Alex Hill, General Manager, Green Energy Benny Farm		
Daniel Pearl, Partner, L'Office de l'eclectisme urbain et fonctionnel (L'OEUF)		
Canadian Urban Institute		
Glen Murray, President and Chief Executive Officer		
Brent Gilmour, Director, Urban Solutions		
Minto Group		
Greg Rogers, Executive Vice-President		
Andrew Pride, Vice-President, Minto Green Team		
Town of Two Hills		
Trevor Nickel, Representative, Assistant General Manager, Highmark Renewables Research LP and Growing Power Hairy Hill LP		
Shane Chrapko, Representative, Chief Executive Officer, Growing Power Hairy Hill LP		
As an individual	2009/03/31	12
Atif Kubursi, Professor, Economics, McMaster University		
Martin Lee-Gosselin, Professor, Université Laval and Imperial College London		
M.K. Jaccard and Associates Inc.		
Christopher Bataille, Director		
Robert Joshi, Consultant		

Organizations and Individuals	Date	Meeting
Canadian Solar Industries Association		
Elizabeth McDonald, Executive Director	2009/04/02	13
Wes Johnston, Director, Policy and Research		
Centre for Agricultural Renewable Energy and Sustainability		
Abimbola Abiola, Chair, Olds College School of Innovation		
Art Schaafsma, Director, Ridgetown Campus, University of Guelph		
Net-Zero Energy Home Coalition		
Gordon Shields, Executive Director		
Bruce Bibby, Representative, Manager, Energy Conservation, Hydro Ottawa Limited		
Pollution Probe		
Bob Oliver, Executive Director		
As an individual	2009/04/21	14
Alan Meier, Associate Director, Energy Efficiency Centre at University of California, Davis, and Senior Scientist, Lawrence Berkeley National Laboratory		
Blue Green Alliance		
David Foster, Executive Director		
As an individual	2009/04/23	15
Peter Öhrström, Ortelius Management AB, Sweden		
Arne Sandin, Triple-E, Sweden		
Christine Wörlen, Arepo Consult, Germany		

APPENDIX C
LIST OF BRIEFS

Organizations and Individuals
Benny Farm
Canada Green Building Council
Canadian Water and Wastewater Association
Centre for Agricultural Renewable Energy and Sustainability
Kubursi, Atif
M.K. Jaccard and Associates Inc.
Quality Urban Energy Systems of Tomorrow
Québec Federation of Forestry Cooperatives

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant Minutes of Proceedings (Meetings Nos. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22 and 26) is tabled.

Respectfully submitted,

Leon Benoit, MP

Chair

BLOC QUÉBÉCOIS DISSENTING OPINION

TO THE REPORT OF THE STANDING COMMITTEE ON NATURAL RESOURCES ON THE EXAMINATION OF THE CONTRIBUTION OF INTEGRATED APPROACHES FOR PROVIDING ENERGY SERVICES IN CANADIAN COMMUNITIES

PRESENTED TO THE STANDING COMMITTEE ON NATURAL RESOURCES

June 2009

First of all, the Bloc Québécois wishes to thank all the witnesses who appeared before the Standing Committee on Natural Resources during the hearings in Ottawa. Their input helps us understand the various opportunities and benefits of an integrated energy approach.

The Bloc Québécois supports the objectives of the Committee's study on the whole and commends all parliamentarians for their interest in the effective and integrated use of energy in communities.

While this study did produce a number of findings and provided for the exploration of solutions to the issue, the Bloc Québécois cannot support this report and has serious reservations about some of the recommendations.

The adoption of an integrated energy approach in communities would provide for the more effective use of resources and would save energy. According to the report, this approach is warranted by the fact that communities' energy consumption and greenhouse gas emissions are estimated at half of total consumption and emissions in Canada. Moreover, the participation of this sector is considered necessary to achieving the greenhouse gas reduction targets set by the federal government.

Let us recall that the federal government made the ideological choice to ignore its commitment to climate change and to disregard its obligations under the Kyoto Protocol.

At the same time, provinces such as Quebec have made considerable efforts to reduce their greenhouse gas emissions.

So it is entirely inappropriate to attempt to impose urban development models right across Canada to make up for the government's lack of rigour and willingness to introduce serious regulations and to offset the generosity that some industries have benefited from to date.

Moreover, the strategy recommended in this report blithely encroaches on matters under the jurisdiction of Quebec and the provinces and seeks to establish a direct dialogue with municipalities, which is obviously not the federal government's role. In this regard, both the governing party and the opposition parties show a paternalistic and centralist attitude whereas the Bloc Québécois firmly believes that Canada needs approaches that reflect regional realities and that the best way to achieve conclusive results is to allow Quebec and the provinces to make their own choices in matters under their jurisdiction.

In this regard, the Bloc Québécois maintains that federal leadership can be relevant provided that Quebec and the provinces receive sufficient resources and the freedom to make their respective choices. In the opinion of the Bloc Québécois, the federal government clearly should not develop a national energy policy or set electricity fees, for instance. The program budgets referred to in the recommendations should be transferred unconditionally, with full control given to the provinces and territories.

Workforce training, education and land management and development are all areas under provincial jurisdiction in which the report’s recommendations encourage the federal government to play a role. This is completely unacceptable to the Bloc Québécois.