



Energy Efficiency and Conservation: The Cornerstone of a Sustainable Energy Future

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This paper is one of eight background reports on the Canadian Renewable Energy Alliance's model framework and recommendations for a comprehensive Canadian renewable energy strategy. This paper includes recommendations for provincial energy efficiency and conservation policies and for actions backed up by national enabling measures and international participation.

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The Canadian Renewable Energy Alliance (CanREA) is an alliance of Canadian civil society organizations from the non-profit or voluntary sector that share an interest in maximizing energy efficiency and conservation and promoting a global transition to low-impact renewable energy. Members of CanREA believe that this transition is needed to address global climate change, pollution, global energy supply, human security, poverty eradication and economic sustainability. CanREA recognizes that our window of opportunity is limited and that this global transition must begin now through individual country action, international co-operation and a range of innovative market instruments, regulatory measures, public education efforts and voluntary actions.

The organizations actively involved in the formation of CanREA include:

- Canadian Association for Renewable Energies
- BC Sustainable Energy Association
- The David Suzuki Foundation
- Falls Brook Centre
- The Halifax Initiative
- One Sky—The Canadian Institute for Sustainable Living
- The Ontario Sustainable Energy Association
- The Pembina Institute
- Pollution Probe
- The Saskatchewan Environmental Society
- The Sierra Youth Coalition
- STORM Coalition

For more information on CanREA and its members, visit our website at www.canrea.ca

Energy Efficiency and Conservation: The Cornerstone of a Sustainable Energy Future

Energy efficiency is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change.

—California's Energy Action Plan II¹

Energy efficiency is likely to be the cheapest and safest way of addressing all [of our energy] objectives, while also strengthening energy security and improving our industrial competitiveness as we develop cleaner technologies, products and processes.

—UK Energy White Paper²

Using energy as efficiently and effectively as possible is essential if we are to meet future energy needs and see a global transition to sustainable energy sources. Without major changes to the way we use energy to meet our needs (energy conservation) and a commitment to the most efficient equipment and measures (energy efficiency), there is little hope of reducing the impact of energy production and use to reasonable levels.

Fortunately, energy efficiency and conservation are the lowest cost options for meeting energy needs, and they provide many other environmental, economic and social benefits as well:

- overall cost savings from lower expenditures on energy;
- a lower environmental load from avoiding the greenhouse gas and local air, water and land emissions associated with energy production and consumption;
- local economic-development opportunities and associated new jobs;
- an energy system with enhanced reliability and less price volatility; and
- improved energy-supply security.

Although it is in consumers' and the public interest to use energy more efficiently, there are several reasons why energy users and providers of energy such as utilities do not invest in efficient technologies and practices. Consumers often do not have access to efficient technologies, do not have accurate or adequate information about them or the time or capability to assess them, and do not recognize that the extra cost of these improvements can be more than recovered through savings. Government energy policies also do not reflect the full environmental costs of conventional energy sources or the economic, employment and security benefits of energy efficiency. Finally, utilities delivering electricity and gas often view efficiency in terms of loss of market share. As a result, when trying to meet a growing demand for energy, utilities tend to think first of new energy supply options.

It is left to governments, therefore, to put policies and programs in place that give value to energy efficiency and conservation in the marketplace, to transform markets to high efficiency products, and to encourage investments in these resources. To be effective, governments must co-ordinate the efforts of many players—linking actions by energy users, private sector suppliers and energy utilities while making sure the right incentives and disincentives are in place to achieve well-defined energy efficiency goals. Simply providing information and financial incentives is not sufficient to transform energy using markets or produce deep, reliable and permanent savings. Table 1, appearing on the next page, illustrates some of the roles that government, utilities, private-sector suppliers and consumers can each play in improving energy efficiency.

Energy efficiency programs focus on reducing an energy user's overall energy requirements without affecting the quality of energy services they receive. An energy efficiency improvement typically results from installing an energy efficiency technology or adopting a more energy-efficient practice. It can involve changing equipment use, building design, industrial processes

¹ California Energy Commission. 2005. *California's Energy Action Plan II*, p. 3.

² Department of Trade and Industry. 2003. *UK Energy White Paper, Our Energy Future—Creating a Low Carbon Economy*, <http://www.dti.gov.uk/energy/whitepaper/ourenergyfuture.pdf>

and management practices in ways that reduce the total cost of energy services over time:

- adding insulation in building walls and roofs;
- installing high-efficiency lighting;
- using high-efficiency industrial motors, hybrid vehicles, engine management (reduced-idling) systems;
- retrofitting furnaces and hot water tanks; and
- sealing leaks in walls and around doors and windows to stop drafts and discourage heat loss.

The following policies and programs are among the many that can give value to energy efficiency and encourage investment:

- building code and efficiency standards
- information and labelling programs

Stakeholder	Roles
Society (as Represented by Government)	<p>Foundation and Leadership:</p> <ul style="list-style-type: none"> • understand the potential of energy efficiency and provide vision, strategies and targets • procure energy efficiency technologies services to initiate market transformation <p>Regulation:</p> <ul style="list-style-type: none"> • set legal targets and incentive mechanisms for utilities • set minimum efficiency standards/codes for buildings, vehicles, equipment, etc. <p>Financial Incentives:</p> <ul style="list-style-type: none"> • provide financing/revolving funds • assist low income consumers • provide tax credits for energy efficiency actions <p>Market Transformation:</p> <ul style="list-style-type: none"> • develop national protocols for labelling high-efficiency products and maintain quality assurance • co-ordinate and standardize training • provide access to information and evaluation of options
Utilities	<ul style="list-style-type: none"> • design and deliver demand side management programs • utilize customer knowledge and billing systems • provide financing and share in the cost of measures if financially beneficial to the utility
Private Sector Suppliers	<ul style="list-style-type: none"> • provide energy-efficient equipment and product information • provide energy efficiency design, building and other contract services • provide financing • deliver programs under contract (bidding/standing offers)
Energy Users	<ul style="list-style-type: none"> • undertake energy management training • maximize use of low-cost efficiency measures • finance higher cost-efficiency measures from savings

- technical assistance and audits
- financial incentives to reduce the incremental first cost of efficiency
- financing mechanisms where energy savings pay for the increased cost
- training and certification of contractors
- market transformation collaboration with equipment suppliers and builders.

Demand side management (DSM) refers to energy efficiency programs delivered by utilities. These programs consist of the planning, implementing and monitoring activities of electric and gas utilities designed to encourage consumers to reduce their level and modify their pattern of electricity (or gas) usage.³ DSM programs typically promote the use of high-efficiency technology and facility design among customers. DSM programs can range from information or training programs that do not provide any actual financial assistance to end users, to financial incentive programs in which all or part of the cost of the efficient technology or design is paid for by the utility. Utilities will normally undertake DSM programs if there are net financial benefits from doing so, or if the net benefits are greater than those realized from using energy supply options when energy demand increases.

Energy conservation typically refers to actual changes to the way we use energy. This includes eliminating the waste of energy through engine idling, excess cooling and lighting levels, and other preventable practices. It also includes changing urban design to reduce sprawl, introducing producer responsibility to reduce materials use, or making public transit a real alternative. These changes will become more and more important as Canada and the world face the growing demand for energy services in developing countries while at the same time make deep reductions in emissions of greenhouse gas (GHG) and other pollutants.

Changing the way we use energy will require that governments consider a much broader range of policy and program options. For example, initiatives like packaging protocols, producer responsibility and cradle-to-cradle manufacturing regulations that reduce the demand for materials will all reduce the demand for energy, but they will need to be implemented as part of an overall environmental and economic policy.

Many observers agree that the world is only just beginning to get serious about energy efficiency and conservation as environmental, security and economic concerns about conventional energy grow. Energy demand needs to be reduced by as much as 40% of today's levels through efficiency and conservation to allow the world to equitably meet energy demand with sustainable energy sources such as renewable energy.

Overview of Canadian Actions on Energy Efficiency

Government Support:

Canada began supporting energy conservation and efficiency in the 1970s when it set up the federal Office of Energy Conservation (OEC) and programs such as the Canadian Home Insulation Program (CHIP), the Canadian Industrial Program for Energy Conservation (CIPEC) and EnerGuide appliance labeling. The driving force at that time was oil prices and scarcity. During the early 1980s, the federal and provincial governments set up energy conservation information centres across Canada, but it was not until environmental concerns like smog and climate change became issues in the late 1980s and early 1990s that additional support was provided to energy efficiency initiatives.

The past 10 years saw the introduction of a wide range of market transformation programs by Natural Resources Canada's Office of Energy Efficiency (OEE) that provided technical assistance, quality assurance, and training as well as financial incentives. These include the EnerGuide for Houses audit and rebate program, the Canadian Building Incentive Program (CBIP), Energy Innovators, Energy Star as well as programs encouraging vehicle fleet efficiency. OEE has also managed the setting of energy performance standards for equipment under the Energy Efficiency Act. The National Advisory Council on Energy Efficiency was set up in the late 1990s. In 2004, the Council of Energy Ministers established an ADM steering committee and working group on energy efficiency and DSM to co-ordinate national collaboration on energy efficiency policies and programs. This initiative has already led to federal/provincial co-operation on energy codes, equipment standards, low income housing and lighting efficiency.

³ Electronic Industries Alliance (EIA). 1997. *Electric Utility Demand Side Management 1997 Executive Summary*, www.eia.doe.gov/cneaf/electricity/dsm/dsm_sum.html

At the provincial level, Manitoba and the Yukon Territory were rated highest for their energy efficiency programs in a 2004 “report card” published by the Canadian Energy Efficiency Alliance (CEEAA).⁴ A few provinces maintain dedicated centres responsible for the delivery of energy efficiency programs, including New Brunswick, Ontario, Quebec, Saskatchewan and Alberta. Only three provinces have energy efficiency requirements included in their building codes, yet several provinces are working together with the federal government to harmonize building code requirements and update the National Model Energy Code for Buildings.

British Columbia is the only province to set milestones for building efficiency in its new building efficiency strategy.⁵ Energy efficiency is at the heart of the new energy policy tabled by the Quebec government in the spring of 2006. In Ontario, the government has set the new Conservation Bureau with a target of 1000 MW of energy efficiency by 2012. However, critics say that much more than that would be possible if the province followed the best practices used in other countries.⁶

The Canadian Energy Efficiency Alliance has been in operation since 1990 and includes members from the energy efficiency industry, utilities and non-government organizations. Other Canadian non-government associations that promote high efficiency include the Canadian Green Building Council⁷ and the National Association of Insulation Manufacturers.⁸

Demand Side Management:

Canadian energy utilities began to offer demand side management (DSM) programs in the 1970s as load management initiatives to reduce customer usage during peak demand, thereby avoiding supply problems and deferring the need to build new plants. During the 1980s and early 1990s, however, utilities such as BC Hydro, Ontario Hydro and Manitoba Hydro began to design and deliver DSM programs as a service to their customers. Regulatory systems were also put in place in some provinces that required an integrated resource planning (IRP) approach to capacity expansion and tariff setting. This required DSM programs to be considered on an equal footing with supply options. Targeted DSM programs were designed to defer the need for new supply options.

In the mid-1990s, the deregulation of the energy sector and the breaking up of utilities into separate generation and distribution entities had a major impact on DSM. There were fewer incentives for utilities to invest in DSM, and large energy users had access to lower-priced power supplies from competing sources. Since 1995, there has been a trend back towards the IRP approach with regulators in British Columbia and Ontario focusing on retail gas and power distribution utilities and using innovative market-based incentives, financing and regulatory tools to level the playing field between supply and DSM resources. The Canadian Electrical and Gas Associations are active in promoting DSM among their members. BC Hydro, MB Hydro, Enbridge and SaskEnergy have received Best Practice designation from Canadian Energy Efficiency Alliance.

Canada is lagging behind other Nations:

Historically, Canada has made relatively strong overall improvements in energy efficiency,⁹ but analyses by the federal government indicate that these improvements have declined in recent years. Annual increases in the contribution of energy efficiency to lowering total energy consumption have been decreasing since 1997.¹⁰ A stronger commitment to energy efficiency would produce increasing or at least constant annual contributions to energy efficiency (see the discussion of best practices below). More savings are definitely possible. Recent assessments of the easily-achievable energy efficiency potential in Canada revealed that total energy demand could be cost-effectively reduced by over 15%—and electricity by 25%—over fifteen years. In 2004, The Pembina Institute demonstrated that electricity demand in Ontario could be reduced by nearly 40% with available technology and aggressive policies over the same time-frame.

In May 2006, the federal government indicated that it will cut many energy efficiency programs such as the EnerGuide for Houses program. These cuts will continue the trend of declining energy efficiency improvements. Meanwhile, many jurisdictions outside Canada are aggressively pursuing the energy efficiency resource as a means to meeting their region’s requirements at the lowest economic and environmental cost and with the least financial risk.

⁴ <http://www.energyefficiency.org/>

⁵ <http://www.empr.gov.bc.ca/AlternativeEnergy/EnergyEfficiency/default.htm>

⁶ The Pembina Institute. 2006. *A Quick-Start Energy-Efficiency Strategy for Ontario*, <http://www.pembina.org/>

⁷ <http://www.cagbc.org/>

⁸ <http://www.naimacanada.ca/>

⁹ International Energy Agency. 2004. **TITLE?**

¹⁰ Natural Resources Canada. 2005. *Energy Efficiency Trends Analysis Tables: Canada*, http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/analysis_ca.cfm?attr=0

California, for example, has three-year cycles of building-code improvements and financial incentives for builders so that new building efficiency is always improving. Only two Canadian provinces have energy efficiency requirements in their building codes, and they have not been updated for many years.

Best Practices in Energy Efficiency Policy

Canada can lay claim to using a few best practices in promoting energy efficiency:

- The DSM incentive mechanisms used in Ontario and British Columbia give utilities a permanent incentive to deliver efficiency services.
- The CIPEC and EnerGuide for Homes Programs have enjoyed great support and participation, achieving significant gains in the sectors they serve.
- New Brunswick has recently set up Efficiency New Brunswick, a one-stop window for all energy efficiency programs in the province.
- British Columbia has well-defined 2010 milestones for new-building efficiency in its Energy Efficient Building Strategy.
- The Council of Energy Ministers Working Group on energy efficiency promises to be a focal point for national energy efficiency planning.

We need only look to the United States and Europe, however, to see what can be achieved by co-ordinated, comprehensive and long-term energy efficiency policies. Experience in the UK and in a number of leading US jurisdictions such as California, Vermont and New York shows that successful energy efficiency strategies share several key themes:¹¹

1. **Showing leadership in making energy efficiency a priority in energy policy.** Jurisdictions with successful energy efficiency strategies often demonstrate their long-term commitment to energy efficiency by recognizing its many benefits in broad-ranging energy planning and policy documents.
2. **Setting legally binding targets for energy savings and giving full market value to energy efficiency.** By setting targets with strong financial disincentives for failing to meet energy savings, regions are better able to track and measure success and adjust plans as needed. A few regions are now using tradable certificates to give full market value to efficiency, allowing utilities additional flexibility in meeting the targets and expanding the market for delivering energy efficiency programs to non-utility providers.
3. **Providing stable financing and institutional structures to deliver energy efficiency.** The most effective strategies have provided for i) long-term funding through a permanent funding mechanism, ii) a permanent institutional structure to deliver energy savings, and iii) specified consultation processes and review cycles for future updates to building codes, appliance standards, utility efficiency programs and other strategies.
4. **Developing comprehensive programs.** To counter the different price and non-market barriers to energy efficiency, jurisdictions have established wide coverage of programs that include financial incentives, technical assistance to supplier and users, and industry development measures. The type of program(s) used in each sector is matched to the specific market barrier to be addressed.
5. **Establishing measurement and verification (M&V) protocols.** The most successful strategies provide all players with information on program performance, use independent verification, and revise future actions and programming based on the information provided.
6. **Supporting research and development (R&D).** R&D helps prepare everyone for changes in the future by providing a means of developing and testing new technologies and responding to unexpected changes and new information.

Leadership and Binding Targets:

Governments must set targets and milestones for energy efficiency¹² and involve all stakeholders in long-range planning. The US has recently instituted a Leadership Group to develop a US Energy Efficiency Action Plan. The Group is drawn from

¹¹ The Pembina Institute. 2006. *Successful Strategies for Energy Efficiency: Review of approaches in other jurisdictions and recommendations for Canada*, <http://www.pembina.org/>

¹² A target is a long-term objective such as 50% reduction in lighting energy use over 20 years. A milestone is a short-term objective such as phasing out incandescent lamps by 2012.

federal, state and local government, the energy efficiency industry, utilities and non-governmental organizations (NGOs).¹³

Working groups will identify key barriers to greater investment in energy efficiency and work to remove these barriers in order to improve the acceptance and use of energy efficiency relative to energy supply options. The working groups will identify sound business practices for addressing the key barriers frequently found in policy development, utility resource planning and program implementation.

In 2005, the European Commission adopted a green paper on energy efficiency, outlining an ambitious program to harness cost-effective energy savings for Europe that are equivalent to 20% of the EU's current energy use. This means reducing the amount spent on energy, mainly imported hydrocarbons, by 60 billion euros per annum—the present energy consumption of Germany and Finland combined.¹⁴ Many EU member countries have established national strategies to meet these goals. European countries such as the United Kingdom, France and Italy, and US states such as Texas, California, Vermont and Colorado have set legal efficiency targets for utilities (energy efficiency resource standards). Others US states such as Pennsylvania include energy efficiency in their renewable energy portfolio standards.

An interesting new approach designed to help utilities meet efficiency targets at the least cost involves issuing tradable permits or “white certificates” that allow energy providers to “purchase” efficiency from their customers or third parties. France and Italy adopted this approach in 2005, and their white certificate programs are attracting interest throughout Europe. Several EU countries have set up the Euro White Certificate project,¹⁵ and the International Energy Agency has established Task XIV to study and promote the concept.¹⁶ Similarly, the Australian State of New South Wales has set up a white certificate program as part of its GHG abatement program.¹⁷

Governments that use best practices also provide leadership by requiring the highest levels of efficiency in their own buildings and in those that they finance or lease. Arizona has targeted a 10% reduction per square foot by 2008; 15% by 2011. California will make its public buildings 20% more efficient by 2015 and encourages the private sector to follow suit. In Seattle, any public building project of 5,000 or more square feet of occupied space must achieve a LEED Silver rating; private commercial buildings are eligible for financial incentives. Such efforts kick start market transformation as they demonstrate new approaches.

In many countries, municipalities also play a major role in achieving gains in energy efficiency. The International Council for Local Environmental Initiatives (ICLEI) offers a five-step program for municipalities to reduce energy use and other GHG emitting activities as part of its Partners for Climate Protection Program.¹⁸ The province of British Columbia in co-operation with the federal government is running two pilot community energy planning projects. The Pembina Institute works with First Nations and small municipalities to analyze community energy options and implementation plans.

Municipal innovations in energy efficiency programming include the use of local improvement charges to finance building efficiency improvements. By associating their cost with the property and not the owner, improvements that require longer payback become feasible. Canada is leading the way in promoting this concept.¹⁹

Providing an Infrastructure—Co-ordination, Funding and Review Cycles:

Successful jurisdictions vary in the kinds of institutions they use to deliver efficiency, but their common thread is to have a single agency provide the overall co-ordination and management. In the US, energy efficiency programs are administered by a range of institutions (see box on next page).

Vermont uses a non-profit agency retained under contract to deliver energy efficiency programs.²⁰ The UK takes the same approach using the Eaga partnership.²¹ Wisconsin has a joint public/private entity to do the same.²²

¹³ <http://www.epa.gov/cleanenergy/eeactionplan.htm>

¹⁴ http://europa.eu.int/comm/energy/efficiency/index_en.htm

¹⁵ <http://www.ewc.polimi.it/>

¹⁶ <http://dsm.iea.org>

¹⁷ <http://www.ewc.polimi.it/rdocu.php>

¹⁸ <http://www.iclei.org/index.php?id=810>

¹⁹ http://www.pembina.org/publications_item.asp?id=197

²⁰ <http://www.encyvermont.com/>

²¹ <http://www.eaga.co.uk/>

²² <http://www.focusonenergy.com/index.jsp>

Energy efficiency programs are administered in the United States by:

- Utilities—AZ, MA, NV, NH, RI, TX
- Government agencies—IL, ME, MI, NJ, NY, OH, WI
- Independent agencies—OR, VT
- Hybrid—CA, CT, MT

Spending levels are equivalent to 0.7% to 3% of energy revenues, cost effectiveness \$0.023/kWh to \$0.044/kWh, and annual savings range from 0.1% to 0.8% of sales.

Efficiency Vermont:

- started in 2000
- won award from Harvard's Kennedy School of Government
- contract stipulates annual savings targets, significant money to meet the targets

Energy Trust of Oregon:

- started in 2002
- includes electricity and gas efficiency and renewable energy programs
- OPUC sets performance measures, including annual electricity and natural gas savings

California delivers programs through major utilities and non-profit groups but co-ordinates them through the California Energy Commission.

Eighteen US states raise funds through a regulated Public Benefits Charge (PBC) to provide customers with efficiency programs.²³ The PBC is a small, legislated, permanent, rate-based funding mechanism that is paid by every electricity or gas user to finance energy conservation and efficiency programs.

Fourty US States have also legislated three- or four-year cycles for reviewing and upgrading the energy efficiency requirements in building codes. States help builders and buyers prepare for these regular improvements through an on-going dialogue and financial incentives. Nineteen states have equipment standards that supplement federal standards, and many have a regular standard review cycle. Since 2004, 10 states enacted new standards on 5–30 products, and in August 2005, US federal law adopted 15 of these state-based standards. California won ACEEE's best practices award for collaboration with utilities when setting the standards. The key elements in a successful standards and codes program are a legislated periodic review and input from stakeholders.

Labeling buildings and equipment for performance and as best in class is another essential element of successful programming. Labels are used to guide consumers and to provide the basis for measures that give value to high efficiency such as financial incentives and tradable certificates.

Comprehensive Programs—Market Transformation, Financial Incentives and Innovation:

The most successful energy efficiency programs are those that have an objective to transform markets for energy using equipment. They consider the whole supply chain and not just consumers. Examples of these programs include building operator training and Energy Star housing programs.

Best practice in providing financial incentives ensures that the support goes to the most effective point in the supply chain. This may be a tax credit for industrial investments or green buildings, a performance-based rebate to builders of efficient

²³ US Environmental Protection Agency. 2005. Clean Energy-Environment Guide to Action, <http://www.epa.gov/cleanenergy/stateandloacl/activities.htm>

housing, a sales tax rebate on appliances, or the reimbursement of training costs for certified installers. Incentives need to be large enough to kick start market transformation, and they need to stay in place long enough to prevent back sliding.

Market transformation also needs to be co-ordinated closely with code and standards cycles to bring the majority of users and suppliers up to the new energy efficiency levels before the new code or minimum efficiency standard comes into effect.

Finally, to complement financial incentives, good programs provide both suppliers and users of energy efficiency equipment and practices with technical assistance to build capacity and capability.

International Co-operation:

There is now global interest in ensuring that deeper efficiency reductions occur globally to support climate change objectives and to help developing countries leapfrog our low-efficiency economies. With the support of the 2005 G8 Gleneagles Declaration, the Renewable Energy and Energy Efficiency Partnership (REEEP) has made energy efficiency its focus for 2006.²⁴ REEEP provides a forum for international and regional discussion of energy efficiency policy and programs, and provides funding for innovative financing and market development projects in developing countries.

Recommendations for Provincial Energy Efficiency Strategies

Our recommendations for provincial governments are based on the best practices used in other jurisdictions and in the discussions on energy efficiency policy that took place at regional CanREA workshops in New Brunswick, Ontario and British Columbia in 2005 and 2006.

Provide Provincial Leadership

1. Set energy efficiency targets for each sector along with appropriate milestones, such as 50% of all buildings retrofitted by a certain date.
2. Consider making efficiency milestones legally binding by using Energy Efficiency Resource Standards and a tradable permit (white certificates) system to provide full market value to best in class equipment and measures.
3. Treat energy efficiency as a resource and give it priority over supply resources. Assess all resources using social, environmental and economic cost criteria.

Set Up a Permanent Infrastructure to Deliver and Finance Energy Efficiency

4. Mandate an independent dedicated agency to co-ordinate and deliver energy efficiency and conservation programs and recommend policy changes
5. Provide permanent funding sources through the budget process to support a building code and equipment standard review cycle, and through a rate-based funding mechanism to finance energy efficiency programming.
6. Introduce a shared-savings DSM incentive mechanism for energy utilities, make technical support available to smaller utilities, and co-ordinate DSM programs across the province.

Codes, Standards and Labeling

7. Establish a regular (e.g. 3-year) review cycle of energy efficiency requirements in building codes, and review the minimum efficiency requirements for equipment on a regular basis. Discuss changes in codes and standards with all stakeholders, and provide supportive incentives to builders and suppliers in the lead up to changes.
8. Label equipment and buildings in terms of their energy performance, providing special labels such as Energy Star for best in class.

Comprehensive Programs and Incentives

9. Provide comprehensive energy efficiency programming that covers all sectors and geographic areas in the province. Use market transformation programs to target the whole supply chain—manufacturers/builders, suppliers, contractors and users/consumers.
10. Offer targeted financial incentives to kick start market transformation, providing effective support to suppliers, users or contractors as appropriate.

²⁴ <http://www.reeep.org/>

11. Support the building of an infrastructure to deliver energy efficiency products and services through training/certification of DSM program managers, contractors, circuit riders and building operators. Provide technical assistance to energy users through circuit riders for buildings, internships for new graduates, etc.
12. Partner with municipalities and First Nations to deliver community energy plans and community-based energy efficiency programs.

Recommendations for a National Energy Efficiency Strategy

The federal government should develop a national plan for maximizing energy efficiency in collaboration with the Provinces, municipalities and the energy efficiency industry. The federal role should be to provide leadership and build a national foundation for energy efficiency and conservation; regulate minimum efficiency levels; remove barriers and build capacity through incentives, training, market support, and quality assurance; and maintain strong links to international efforts to maximize energy efficiency.

Leadership – Laying a National Foundation for Energy Efficiency

- Develop and implement a national energy efficiency strategy and action plan built on the Collaborative Agenda for Energy Efficiency already prepared for the Council of Energy Ministers. Include sector targets and milestones built on those in individual provinces. Suggested time lines for the Strategy: draft 2007, final 2008.
- Expand the mandate of the National Advisory Council on Energy Efficiency to become a Leadership Group with the objective to develop the national energy efficiency strategy and action plan.
- Base the national strategy on sharing of best practices, individual and joint initiatives across provinces, and participation in international initiatives on energy efficiency.
- Using the Office of Energy Efficiency (OEE) as a national energy efficiency secretariat, make the Council of Energy Ministers DSM/energy efficiency working group the main vehicle for federal/provincial co-operation and collaboration.
- Collaborate with the provinces and industry to establish national “road maps,” targets, milestones and implementation plans for energy efficiency in key end-uses such as buildings, houses, vehicles, lighting, cooling and industrial drives.
- Introduce an environmental tax regime that reflects the environmental benefits of energy efficiency and the true life-cycle economic, environmental and social costs of energy sources.

Regulating Energy Efficiency - National Energy Codes and Standards

- Establish a permanent national review cycle of the national model energy code for buildings, EnerGuide for Houses and vehicle efficiency requirements and work in co-operation with the provinces, building on the co-operation already under way under the Council of Energy Ministers.
- Use the Energy Efficiency Act to raise minimum efficiency standards for all energy-using equipment to the highest levels in North America in co-operation with provinces and in harmony with the most progressive US States
- Provide enabling legislation and protocol support for new labeling programs (including highest in class Energy Star) that could be used as the basis for consumer choice, financial incentives and schemes that give identifiable market value to high efficiency such as tradable energy efficiency permits or white certificate systems.

Removing Barriers and Building Capacity

- Provide federal financial incentives for energy efficiency equipment and practices for housing, buildings, appliances, lighting, and industry where they can have a significant impact on market transformation. Carefully choose the types of incentives in conjunction with market leaders.
- Work with suppliers, energy users from each sector, NGOs, municipal and provincial governments and the utilities industry to design and implement national market transformation programs in areas such as building retrofit, new net-zero and green buildings, and lighting efficiency. Provide technical and financial support to these initiatives.
- Provide national quality assurance and technical support for labeling and audit programs such as EnerGuide, Energy Innovators and R2000, as well as innovative financing concepts like local improvement charges and tradable permits systems.
- Put special programs in place to reduce energy costs and raise building standards for First Nations communities and low income families. “Energy poverty” has no place in Canada.
- Work with provincial governments, the energy efficiency industry and educational institutions to provide national support for training/certification of DSM program managers, energy efficiency contractors, circuit riders, and building and vehicle operators. Reimburse part of the cost of training to those who qualify for certification.

International Co-operation

- Expand Canadian participation in international partnerships such as the Renewable Energy and Energy Efficiency Partnership (REEEP), providing funding for the support of energy efficiency in developing countries, and contributing to North American discussions around key energy efficiency issues such as building efficiency, green buildings, energy efficiency portfolio standards and white certificates.
- Have Canada also play a larger role in international tasks dedicated to energy efficiency and DSM such as those under the International Energy Agency (IEA).

Recommendations for Other Actors

Municipalities, First Nations, industry, NGOs and others can also play important roles in accelerating energy efficiency and conservation:

- Canadian Municipalities can play a major role in the planning and delivery of energy efficiency programs, using a community energy planning approach and innovative new concepts such as local improvement charges. Municipalities can also support the development of a local energy service infrastructure and an equipment supply network. Municipal organizations such as Federation of Canadian Municipalities (FCM)²⁵ and the International Council for Local Environmental Initiatives (ICLEI)²⁶ provide technical and financial support for these initiatives. All municipal planning should take energy efficiency into account because decisions on urban form, growth patterns and industry location all have an impact on building and vehicle energy use. The key objective should be accessibility to employment and services at minimum energy.
- First Nations can use community energy planning to identify energy options and incorporate energy efficiency into housing improvement and economic development programs.
- Energy Utilities can implement DSM programs following best practices identified by their peers.²⁷ Utilities should negotiate DSM shared-savings incentive mechanisms with regulators and then fully utilize them to deliver higher savings. Finally, utilities should participate in the delivery of provincial and national programs utilizing their extensive customer database.
- The Energy Efficiency Industry and their associations—equipment and materials suppliers, energy service companies, installation contractors, etc.—can work more closely with each other to advocate increased support for energy efficiency. They can join partnerships such as Renewable Energy and Energy Efficiency Partnership (REEEP) and the Canadian Energy Efficiency Alliance (CEEA) to collaborate with NGOs and other stakeholders.
- NGOs can continue to advocate adoption of best practices, drawing attention to the large efficiency improvements that are needed to meet environmental, economic and social goals. NGOs should work through coalitions like CanREA, CEEA and REEEP in advocating targets, milestones, and national and regional energy efficiency strategies and action plans. NGOs should hold regional, national and international workshops to expand civil society input, help deliver in energy efficiency programs and projects, and raise public awareness and support for efficiency.
- International Funding Institutions such as multilateral banks (WB, EBRD) should increase loans for energy efficiency. REEEP and other partnerships should continue to support energy efficiency. The UN should consider setting a dedicated financial institution to provide financing for energy efficiency.

Conclusion

Canada has a reasonable track record in energy efficiency but has the potential to make significant new gains over the next decade. Energy efficiency and conservation provide cost-saving, environmental (air, water, land, and climate change), security, employment and local economic development benefits. It should become the cornerstone of future Canadian energy policy.

Canada needs a national energy efficiency strategy and action plan developed by provincial and federal governments which expands the support for energy efficiency and learns from best practices used elsewhere. There are also important roles for municipalities, the energy efficiency industry, NGOs, energy utilities, First Nations and international agencies and partnerships.

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²⁵ <http://www.fcm.ca>

²⁶ <http://www.iclei.org>

²⁷ <http://www.indeco.com/www.nsf/papers/DSMbestpractices>