BECOMING THE NATIONAL LEADER IN ENERGY EFFICIENCY

MARCH 2012

ALBERTA

Energy Efficiency Alliance

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Introduction

On November 4th, 2011, Alberta's new Premier sent mandate letters to her Ministers. Four of those letters asked Ministers to "develop an initiative that would make Alberta the national leader in energy efficiency and sustainability."

As a multi-sector organization focused on advancing energy efficiency in the province, the Alberta Energy Efficiency Alliance has compiled this paper with input from over 100 stakeholders as a way to contribute to the government's efforts in this area.

The paper summarizes the importance of energy efficiency as well as the input received from stakeholders on the Government of Alberta mandate.

Summary of Perspectives Heard

Through the process of engaging stakeholders, a number of perspectives became clear.

1. It is challenging to define and measure what it means to be the national leader in energy efficiency. However, this goal has already proven valuable in motivating interest in energy efficiency in the province. Ultimately, our actions will be the most important measure of our success.

2. Other provinces in Canada are already making considerable investments in energy efficiency. Alberta will need to do the same to be considered among the national leaders.

3. There are many opportunities for advancing energy efficiency in Alberta. Ones that are already cost effective could increase Alberta's energy efficiency by more than 14%.

4. Non-economic barriers exist that need to be overcome to achieve this potential.

5. Serious advancement of energy efficiency requires a combination of education, incentives, regulations and other tools. If we take this approach, Alberta will be well-positioned to achieve national excellence in energy efficiency.

The Importance of Energy Efficiency

"[T]he way we use energy leaves a lot to be desired"

Alberta's Provincial Energy Strategy 2008, p. 17

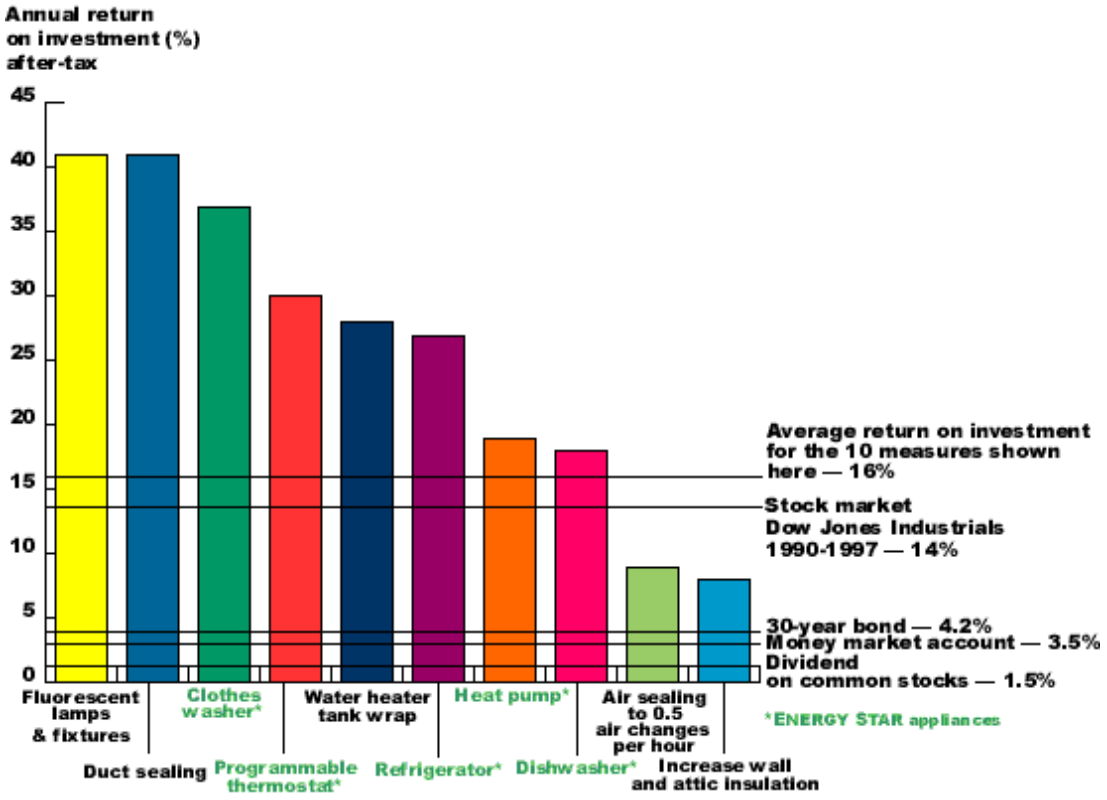
Albertans "are among the highest per-capita energy consumers on the globe"

Alberta's Provincial Energy Strategy 2008, p. 25

Energy efficiency is recognized as the most cost-effective way to improve affordability and reduce the environmental impact of energy production, transmission and use.

There are many energy efficiency measures with returns on investment above 15% (Figure 1) and which provide emission reductions at essentially no net cost (Figure 2). Energy efficiency is also recognized as less expensive and easier to deploy than developing new energy supplies, and it provides greater job creation and economic development potential.[1,2,3] Figure 3 shows the potential for energy efficiency to help meet our ever-growing energy demand.

FIGURE 1: EXAMPLES OF RETURN ON INVESTMENT FOR RESIDENTIAL ENERGY EFFICIENCY MEASURES[4]



Energy efficiency …deserves attention. There is a lot of room to maneuver as Alberta has underperformed in this area. We are the most energy-intensive consumers in the country – even when you don't include our oil and gas industry – and we spend less than anyone on being more efficient. We can do much better. My government will put energy efficiency at the top of the agenda. It is the fastest and most cost effective measure to improve on sustainability; it is the "low-hanging fruit."

Alison Redford Leadership Campaign Materials (2011)

FIGURE 2: ENERGY EFFICIENCY COULD PROVIDE EMISSION REDUCTIONS AT NO NET COST[5]

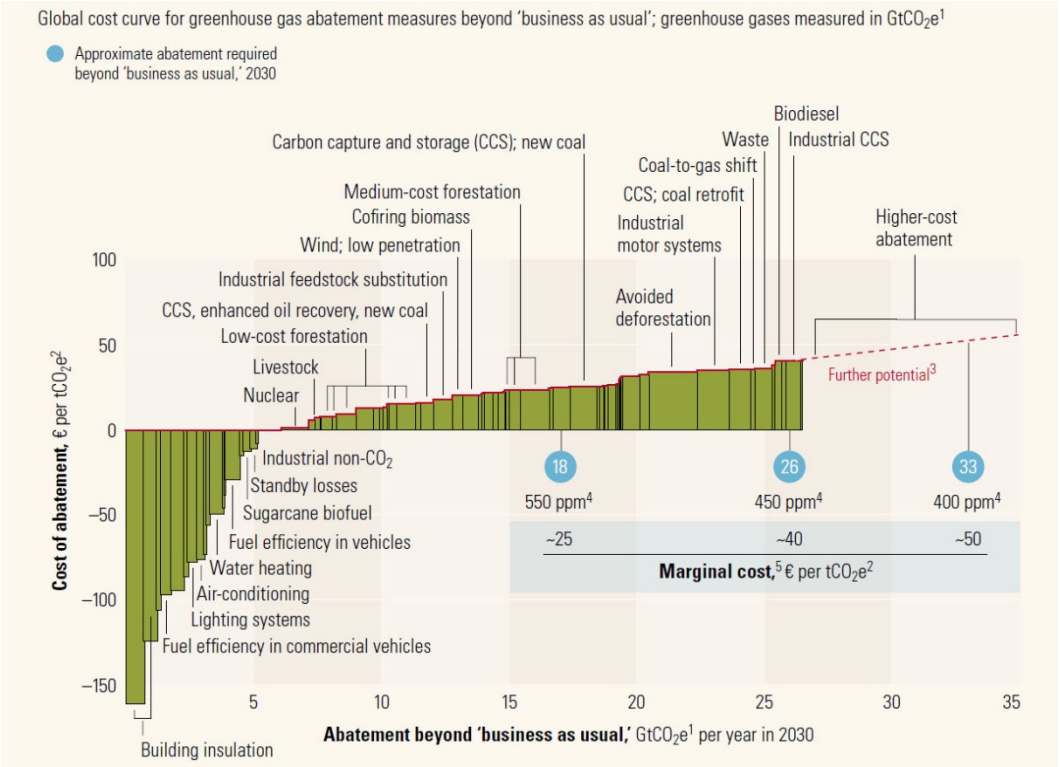
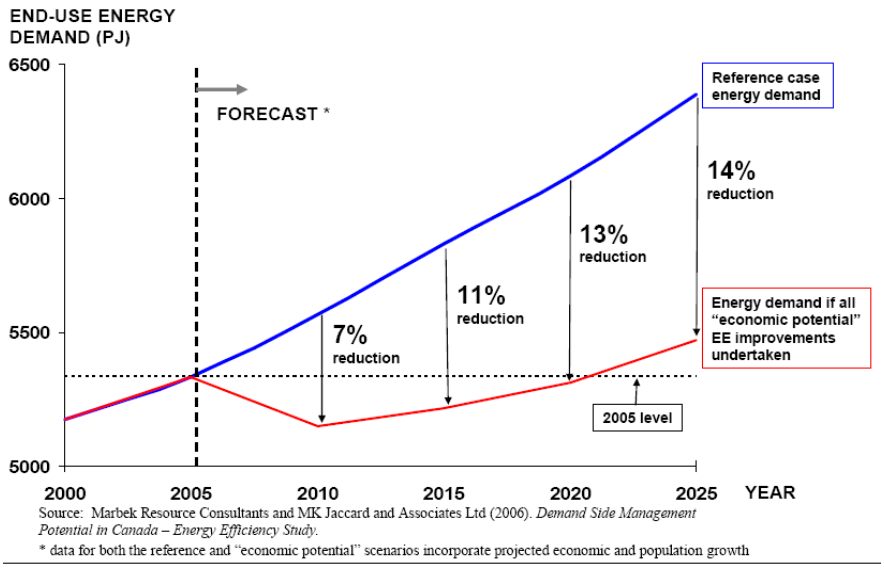


FIGURE 3: ENERGY EFFICIENCY POTENTIAL IN CANADA[6]



Source: Marbek Resource Consultants and MK Jaccard and Associates Ltd (2006). *Demand Side Management Potential in Canada – Energy Efficiency Study.*

* data for both the reference and "economic potential" scenarios incorporate projected economic and population growth

The Business Case for Energy Efficiency

The following section was extracted from a discussion paper developed by Stantec Consulting[7]:

"A range of studies have been completed to estimate the impact of investment in energy efficiency across economies. A recent analysis completed by the American Council for an Energy Efficient Economy[8] concluded that:

> *DSM [Demand Side Management] may be the most invisible, least understood, least-polluting and fastest-growing energy success story of the past 50 years, and that its contribution to US energy security, economic productivity and climate change mitigation is not properly appreciated…*

A similar analysis was completed for six states in the US.[9] This study concluded that:

> *Shifting expenditures away from new generation in favour of energy efficiency measures would have a positive effect on state and regional economies and employment. In other words, by maximizing investment in cost-effective DSM programs, these southwestern states would simultaneously maximize economic growth and employment.*

Similar studies have been completed in British Columbia and Ontario. In the BC Study[10], results of the analysis estimate that a $2 billion investment in energy conservation by BC Hydro will generate $1.9 billion of investment by customers. This investment in turn is estimated to generate a provincial GDP of $6.6 billion ($2008 NPV) over the study period, or an average $220 million a year. The provincial and federal governments are estimated to collect $1.2 billion ($2008 NPV) in additional taxes, or nearly $40 million annually as a result of these activities.

In addition to the positive financial impact, BC Hydro Power Smart DSM programs generate an estimated 34.4 direct full-time jobs per $ million spent. This "employment intensity" compares to an estimated 38.5 direct full-time jobs per $ million from a 2008 Ontario Power Authority study. In contrast, the electric utility industry supports an estimated 4 to 5 direct full-time jobs per $ million (US) of investment expenditures, and the coal mining industry generates an estimated 5 to 8 direct full-time jobs per $ million invested."

Unfortunately, there are many barriers to improving energy efficiency that need to be overcome before its full potential can be realized. These barriers include lack of appropriate price signals, product and service availability, lack of energy literacy and awareness, capital financing, technology development and commercialization, transaction costs, perceived risks and rewards, split or disconnected incentives, and institutional or regulatory barriers.[11]

Many jurisdictions have taken steps to overcome these barriers, and their efforts have demonstrated quantifiable results. For example, in 2007 the state of Vermont offset all of its growth in electricity demand through energy efficiency.[12]

The Government of Alberta has also placed a high priority on improving energy efficiency within the province. Both the Provincial Climate Change and Energy Strategies list **wise and efficient energy use** as one of their top three focus areas.

> "Albertans will be leaders in using energy more effectively and efficiently."
>
> Alberta's 2008 Climate Change Strategy, p. 14
>
> "Government will encourage energy efficiency and conservation at all levels"
>
> Alberta's Provincial Energy Strategy 2008, p. 21
>
> "Strategic support for increased efficiency and conservation … will be one of Alberta's most critical levers in meeting the challenges that the future will pose"
>
> Alberta's Provincial Energy Strategy 2008, p. 38

Energy efficiency is also included in the 2012 business plans of four government ministries.

> Priority Initiative 2.1: Together with the Ministers of Agriculture and Rural Development, Energy and Sustainable Resource Development, design and implement an initiative to make Alberta the national leader in energy efficiency and sustainability.
>
> Environment and Water Business Plan 2012-15

All of Canada's Premiers have also committed to achieving "a 20 per cent increase in energy efficiency by 2020 in their respective jurisdictions."[13]

Defining "National Leader"

When four government ministers were given the mandate to "develop and implement an initiative to make Alberta the national leader in energy efficiency and sustainability," a natural question that emerged is:

How do you define "the national leader in energy efficiency?"

The Alberta Energy Efficiency Alliance posed this question to more than 100 stakeholders through an online survey. It was also a topic of conversation at the AEEA's February 8th event where the results of table conversations were recorded for input to this discussion paper.

Generally, there were a number of potential ways suggested for defining "the national leader in energy efficiency." These include:

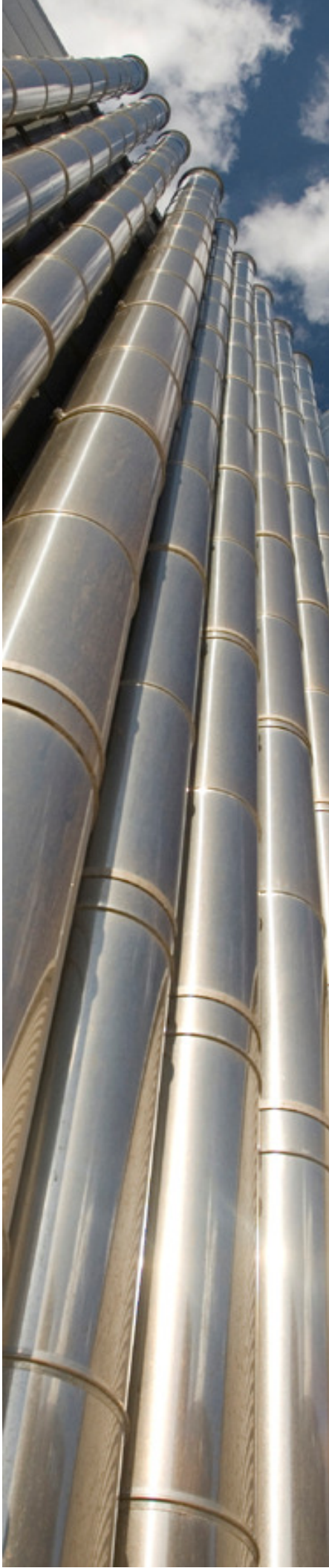
- Energy use per capita, building floor space, distance travelled or production unit (adjusted for weather, geography, etc. and industry specific)
- Energy efficiency regulations for buildings, equipment, vehicles, insulation, industrial processes or land uses
- The size of incentive programs
- The level of innovation being undertaken in the marketplace or with energy efficiency policies and programs

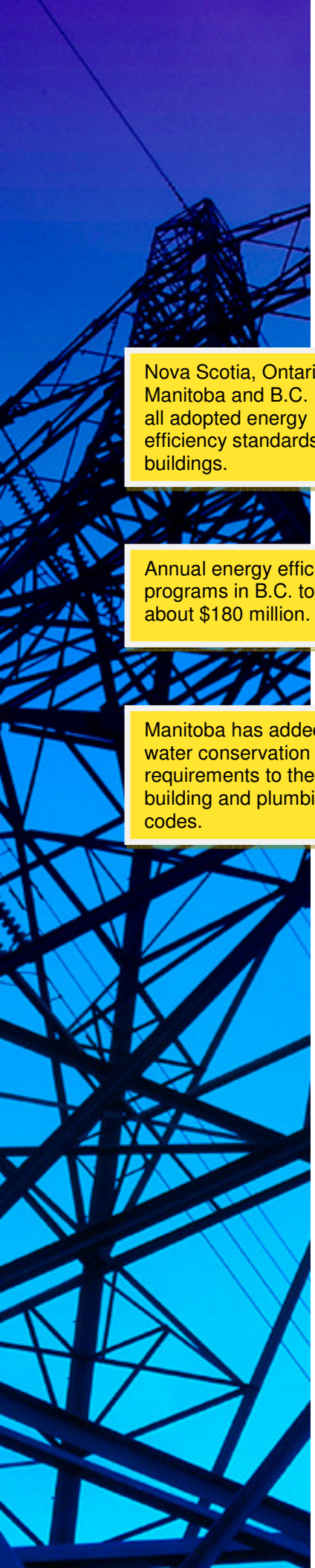
It was also recognized that a number of different methods could be used to measure performance against each of these definitions, and in some cases qualitative judgment is required.

Based on this initial survey of stakeholders, it is clear that there is currently no definitive answer to the question of how to define "the national leader in energy efficiency" unless perhaps a particular jurisdiction is generally recognized to be the best in all of these areas.

Of course, these are all *suggestions* for how the Government of Alberta could define national leadership for themselves. They are the ones that have identified this priority and it is their definition that will ultimately influence how they advance it.

Through the AEEA's experience in discussing the definition of being the national leader in energy efficiency, we have also learned that while it may be a difficult goal to clearly define and measure progress against, it





has been very valuable in generating enthusiasm and interest within stakeholders for advancing energy efficiency in the province.

The goal also provides a strong sense of the scale of the initiative that the government envisions. For example, other provinces in Canada have been considered leaders in energy efficiency for undertaking initiatives such as:

- Increasing codes and standards for buildings, equipment and building materials
- Vehicle emission or fuel economy standards
- Requiring energy distributors to undertake conservation programs
- Feed-in-tariffs for distributed generation
- Long-standing energy efficiency programs
- Investment into municipal infrastructure and transit
- Energy efficiency certification of government buildings
- Large emitters regulations
- Province-wide carbon tax
- Adding water conservation requirements to building and plumbing codes

Nova Scotia, Ontario, Manitoba and B.C. have all adopted energy efficiency standards for buildings.

Annual energy efficiency programs in B.C. total about $180 million.

Manitoba has added water conservation requirements to their building and plumbing codes.

Alberta will undoubtedly be compared with these initiatives as it works to becoming the national leader in energy efficiency.

At the end of the day, we expect that there will always be some uncertainty with defining the national leader in energy efficiency, but the *actions* that are undertaken in pursuit of this goal will have real and tangible impacts. Therefore, the rest of this paper focuses on opportunities to take real, meaningful action to advance energy efficiency in the province.

Opportunities

Much of the AEEA's consultation with stakeholders focused on the opportunities available for increasing energy efficiency in Alberta. These opportunities covered all sectors (buildings, industry and transportation) and the various tools that are available (including regulations, incentives and education).

Over 50 different opportunity areas were identified and are summarized in Appendix A.

Of the opportunities identified, the following ideas were identified as top priorities by a majority of stakeholders:

- Providing incentives for energy efficiency
- Creating sustainable funding for energy efficiency incentives
- Energy efficiency of new and existing buildings
- Increasing energy efficiency requirements within the Alberta Building Code
- Energy efficiency mandates for the AUC, ERCB and AESO
- Energy efficient land use and transportation planning
- Creating an overall strategy including priorities, goals, targets, timelines, research requirements, and monitoring and reporting mechanisms

While these opportunities are of particular interest to stakeholders, it is clear that other actions will need to be taken (in addition to this list) for Alberta to achieve national excellence in energy efficiency.

The opportunities identified in Appendix A can be considered a menu from which to select options for advancing energy efficiency in the province.

Given the large number of opportunities available, a model for fitting them together is also suggested.

Model for Advancing Energy Efficiency

It is common for jurisdictions to take a market transformation approach to advancing energy efficiency.[14,15]

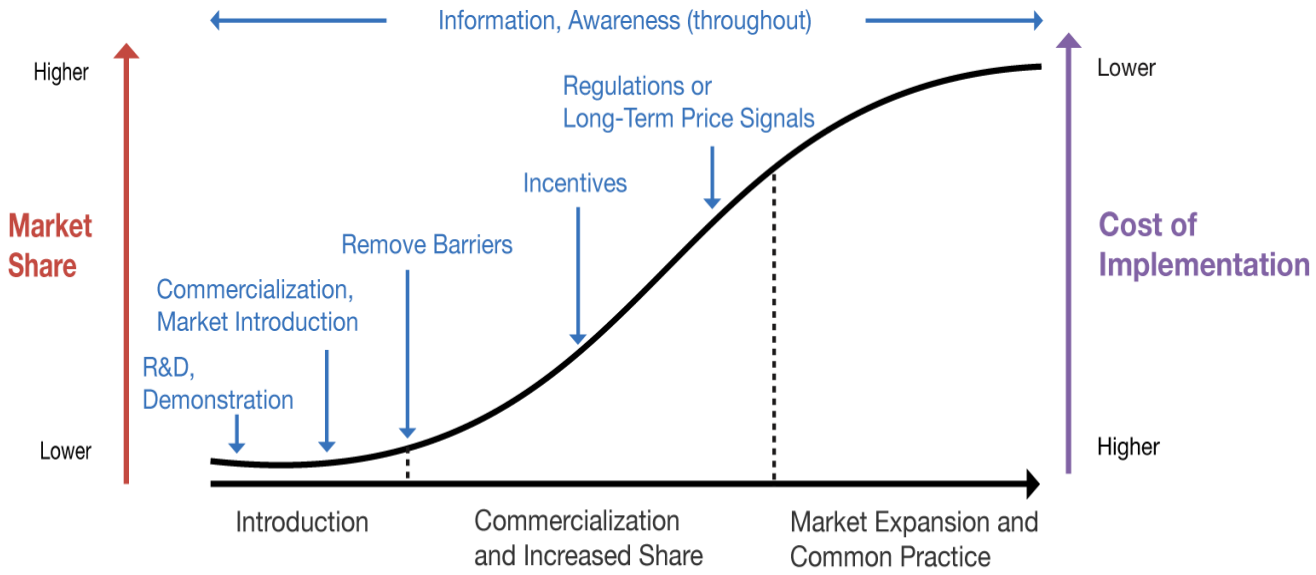
Market transformation occurs when a market makes a sustained transition from one set of products, services and behaviours to another, as shown in Figure 4. In the past, market transformation around energy efficiency has gone through a process of:

- creating new products, services and behaviours, and having them enter the market (commercialization),
- providing incentives to increase market penetration over time, and
- updating codes and standards once a certain level of market penetration is achieved.

Education and outreach supports all stages of market transformation.

This approach combines the advantages of both incentives and regulations while overcoming their weaknesses (e.g., regulations are difficult to enact until capacity is built in the marketplace, and incentives are difficult to maintain permanently). Permanent price signals, such as taxes, are another way to create self-sustaining market transformation if applied properly.

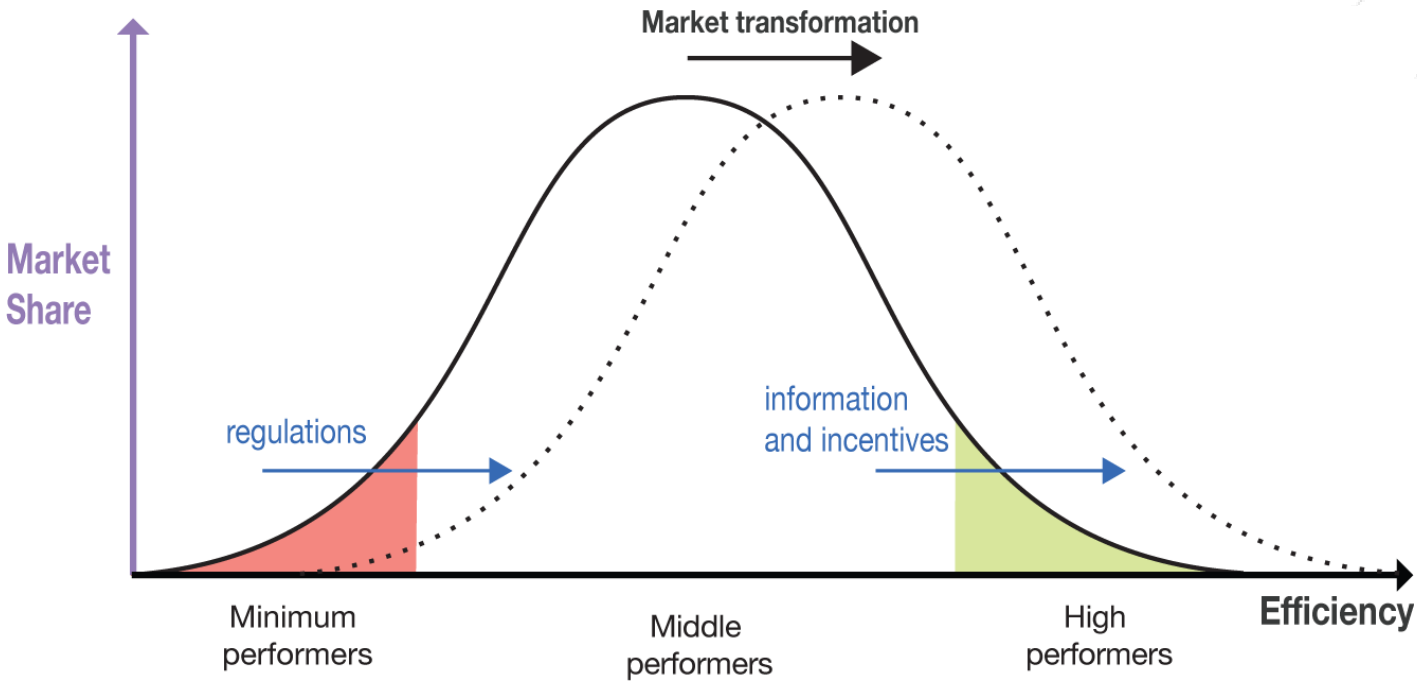
FIGURE 4: MARKET TRANSFORMATION STEPS

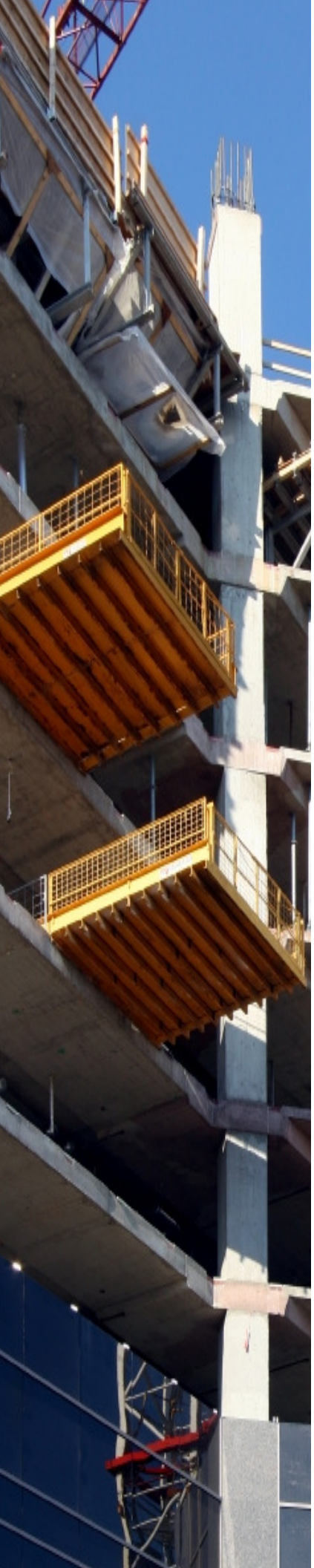


It should be noted that market transformation is also an ongoing process of continuous improvement and not a one-time process for a given sector. In fact, often several steps in the market transformation process are happening at any given time.

As shown in Figure 5 below, marketplaces are typically made up of a set of high performers, middle performers and minimum performers. High performers and middle performers can be motivated by information and incentives — essentially 'pulling' the market to higher performance. Minimum performers are typically only motivated by minimum standards or regulations. By pulling a portion of the marketplace towards more efficient products, services and behaviours, new standards can then be introduced to 'push' the rest of the marketplace forward — creating lasting market transformation. The cycle then begins again with new products, services, behaviours, outreach programs and incentives to pull the market forward; then new standards can push the curve forward once again.

FIGURE 5: MARKET TRANSFORMATION MODEL





SUPPORTING RESEARCH

This approach is supported by research completed by two of the most prominent energy modelling organizations in Canada: Marbek Resource Consultants, and MK Jaccard and Associates. These firms are used widely by governments, including the Government of Alberta, to estimate the potential impact of energy-related policies.

The results of their work to model the energy efficiency potential across Canada[16] shows much greater energy savings are possible through the use of all tools (incentives, education, pricing, regulations and land use planning) as opposed to just incentives and education (see Table 1).

Table 1: Reduction in energy demand in 2025 relative to reference case

Sector	Canada		Alberta	
	Incentives & Education Only	All Tools	Incentives & Education Only	All Tools
Residential	5%	21%	4%	27%
Commercial	4%	18%	2%	20%

Applying the Model

When applying the market transformation model, it is important to identify the current stage of market transformation for each energy end use and the steps needed to achieve full market transformation.

For example, the housing sector currently has the following regulations, information programs and incentives:

- The Alberta Building Code specifies minimum insulation levels.
- EnerGuide ratings and Built Green certifications provide information to owners on the energy performance of houses.
- Programs exist for the training of construction trades.
- Provincial and some municipal programs offer incentives for energy efficient construction and retrofits.

While these actions have already served to advance energy efficiency within the housing sector, in order to achieve national excellence additional actions are required. Input from stakeholders has identified the following opportunities for this sector (see the Appendices for all sectors):

- Adopt the 2012 National Building Code.
- Increase the level of performance required for incentives.
- Expand training programs to include new building practices, upgrading of skills for existing tradespeople and further training of inspectors.
- Increase building code enforcement.
- Expand consumer outreach and information tools.
- Create new financing tools.
- Require upgrades at time of sale.
- Increase municipal powers to impact building efficiency.

Of the opportunities listed, all of them could be undertaken in the short term to advance energy efficiency in the housing sector — except perhaps requiring energy efficiency upgrades at the time of sale. Further education, incentives and other tools are likely required to prepare the marketplace for this measure.

By implementing some or all of the strategies identified, improved energy efficiency within the housing sector can be achieved.

Similar 'roadmaps' for other sectors and sub-sectors are summarized in Appendix B.

Framework for Implementation

As a next step, several stakeholders have recommended that the Government of Alberta develop an overall plan for advancing energy efficiency in the province. This plan would be useful for identifying clear actions to be undertaken.

To develop such a plan, stakeholders have suggested that further consultation be undertaken with all impacted stakeholders to provide industry-specific input on opportunities for advancing energy efficiency. Discussions also need to be undertaken regarding:

- Current barriers to energy efficiency.
- Different methods for funding energy efficiency programs including general revenues, utility rate base, bonds, public-private partnerships, the Climate Change Emission Management Corporation or another mechanism.

- Different methods of distributing funding for a given program including grants, rebates, tax credits, low-interest loans, revolving funds, endowment funds, free or discounted services, or a combination of mechanisms.
- Whether new legislation is needed or would be beneficial.
- The roles played by different market players such as different orders of government, regulators, distribution companies, retailers, energy producers and other organizations.
- Opportunities for 'quick wins' versus longer-term opportunities.
- The cost-benefit and overall level of impact of different actions

Stakeholders have also suggested that the final plan should include:

- A list of priority actions.
- Goals, targets, milestones and/or key performance indicators that are sector and industry specific.
- An existing baseline and benchmarks to compare to.
- Mechanisms for measuring and reporting on progress.
- An analysis of current energy use patterns and other relevant research.

Ultimately, it is clear that stakeholders are eager to see a plan put in place and action undertaken. There is considerable pent-up enthusiasm for energy efficiency in Alberta and many organizations are ready to support its advancement.

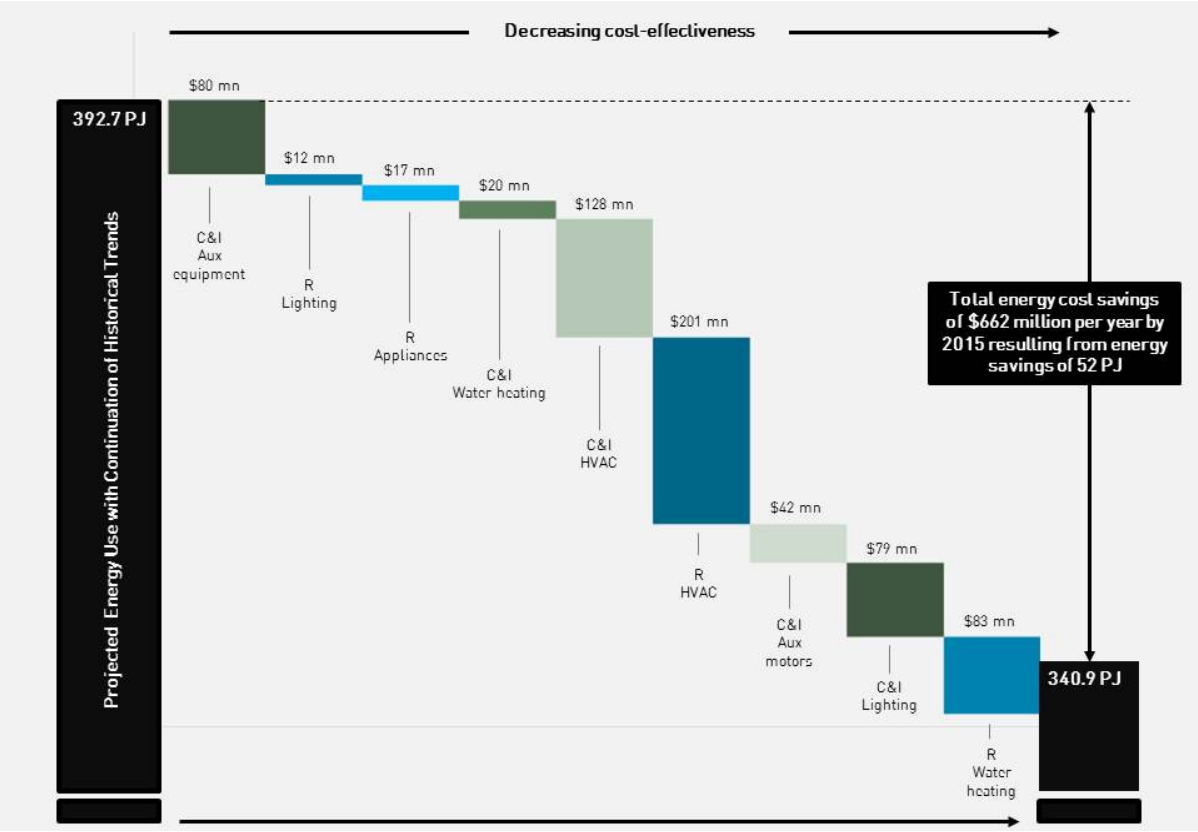
Efficiency Potential for Alberta

It is expected that significant energy efficiency advancements can be made in Alberta if the right approach is taken to realizing these opportunities.

A Conservation Potential Review undertaken by C3 revealed many cost-effective energy efficiency opportunities within Alberta's residential, commercial and institutional sectors. Figure 6 shows that energy use in these sectors can be reduced by 13% within 5 years.

For the industrial sector, Productivity Alberta and Natural Resources Canada have both estimated that energy use could be reduced by up to 25% through economic energy efficiency upgrades.[17,18]

Figure 6: TOTAL ENERGY AND COST SAVINGS FROM IMPLEMENTING ALL COST-EFFECTIVE ENERGY-SAVING MEASURES IN RESIDENTIAL, COMMERCIAL AND INSTITUTIONAL BUILDINGS IN ALBERTA[19]



Closing

The work undertaken by the AEEA to collect input from stakeholders on how Alberta can become the national leader in energy efficiency is meant to provide useful information and support to the provincial government as it works to develop its own plans.

We see this as a starting point within the discussion and look forward to working with the province on refining and advancing opportunities to achieve national excellence in the field of energy efficiency.

APPENDIX A

Opportunities for advancing energy efficiency in Alberta cited by two or more stakeholders.

Energy End Use	Regulations	Incentives*	Education	Other Tools
Buildings - **New** - **Existing**	- Building Code - Upgrades at time of sale - Increased municipal powers - Improved code enforcement	- New - Retrofit - Low-income	- Training of trades, inspectors, drivers - Benchmarking tools - Visible metering - Disclosure of supply impacts - Labelling - Consumer / citizen outreach and community based social marketing - Retrofit support centre	- Green lease - On-bill financing - Property tax financing - Energy management program for large buildings - Identify large heat users (for cogeneration)
Equipment, building products & vehicles	- Minimum standards	- New - Removal of old - Low-income		
Freight		- For idling and aerodynamics		
Distributed Generation	- Require on large new buildings - Solar ready requirement	- Feed-in-tariff		
Cogeneration & district energy	- Require where economic - Increased municipal powers	- Government funding		
Industrial facilities	- Broadened Specified Gas Emitters Regulation - Require audits	- Government funding - Streamlined offset system	- Build into culture - Energy audits	- Energy management program - Financing
Mechanical insulation	- Minimum standards	- New - Retrofit	- Industry and building outreach	
Energy pricing	- Increase cost - Unit price ↑ as consumption ↑	- Time of use metering		
Land use and transportation planning	- Density or mixed use requirements - Provincial, regional and municipal plans		- Consumer / citizen outreach	- Market based instruments
Transit		- Government funding		
Water	- Low flow req. - Use of grey water and rain water	- New - Retrofit	- Consumer / citizen outreach	- Water metering and pricing - Market based instruments
Commercialize technologies		- Government support		

* Includes rebates, tax credits, low interest loans and grants. Requires funding.

In addition to the ideas listed above that are specific to a particular energy end-user, stakeholders also identified opportunities to increase energy efficiency in the province by:

- Including energy efficiency within the mandates of the Alberta Utilities Commission (AUC), the Energy Resources Conservation Board (ERCB), and the Alberta Electric System Operator (AESO)
- Requiring energy distributors and retailers to pursue energy efficiency opportunities with their customers
- Creating a sustainable funding source for energy efficiency programming. Possible mechanisms include a small monthly charge on utility bills, bonds, dedicated funding from the Climate Change Emissions Management Corporation, or the establishment of a large endowment or revolving loan fund.
- Having the provincial government lead by example with their own facilities and operations
- Having the provincial government voice support for federal energy efficiency initiatives
- Hosting an annual energy efficiency conference

Stakeholders also identified a number of government planning-related actions as important to the overall process of creating a comprehensive energy efficiency initiative that has the potential to make Alberta the national leader in this field.

- Creating an overall plan or strategy
- Identifying priorities
- Setting goals, targets, milestones and/or key performance indicators
- Establishing existing baseline and benchmarks to compare to
- Measuring and reporting on progress
- Analyzing current energy use patterns and conducting other research

Stakeholders also voiced support for ensuring that government action planning be undertaken in consultation with all stakeholder groups. This will help to ensure action plans are well aligned with existing industry activities and objectives. Consultation is also expected to assist with setting appropriate goals, baselines, benchmarks and reporting mechanisms to help ensure that each provide an appropriate level of value while keeping costs reasonable and mitigating other potentially negative impacts.

APPENDIX B

The following tables identify the current state of energy efficiency activities for various energy end uses, as well as future steps that can be used to create market transformation, both in the short and longer terms. It should be noted that some opportunities from Appendix A that were not broadly supported by stakeholders for short-term implementation are characterized as longer-term opportunities here.

It should also be noted that while these actions are organized by sector and end use, there are also opportunities that cross multiple sectors and end-uses. A 'systems approach' can be used to further consider these synergies as part of more detailed action planning.

It was also suggested by stakeholders that the following tables are still relatively high level and further definition of these opportunities is required. It is suggested that more detailed analysis of each sector and industry should include industry-specific consultations to help ensure strategies are well aligned and supported by industry participants.

BUILDINGS

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Current building code	- Incentives for new construction and retrofits	- Training programs	
Short-term opportunities	- Adopting the National Energy Code for Buildings (2012) - Adopting the National Building Code (2013) - Increased municipal powers	- Continue incentives beyond March 31, 2012 - Incent higher performers - Extend incentives to commercial buildings - Create a low income program	- Expanded training programs - Benchmarking tools (info. for buildings to compare against their peers) - Visible metering demonstrations - Home energy labels incented - Retrofit support centre	- New financing tools (eg. using utility bills or property taxes) - Green lease - Energy management program for large buildings
Longer-term opportunities	- New building code requirements (either provincial or national process) - Upgrades at time of sale	- Incent higher performers	- Home energy labels required - Visible metering incentives and possibly requirements	

EQUIPMENT, BUILDING PRODUCTS AND VEHICLES

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Federal regulations	- Provincial and some municipal programs	- EnerGuide and Energy Star labels	
Short-term opportunities	- Provincial regulations to cover items manufactured provincially or not regulated federally (eg. doors, windows, HVAC systems)	- Incent higher performers - Extend incentives to more products - Create a low income program - Create a bounty program for old second fridges	- Consumer / citizen outreach	- New financing tools (eg. using utility bills or property taxes)
Longer-term opportunities	- Update existing standards (provincially or federally)	- Incent higher performers		

VEHICLES & FREIGHT

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Federal regulations		- EnerGuide labels	
Short-term opportunities	- Update existing standards (provincially or federally) - Require idle reduction and aerodynamic technologies on freight	- Incent high performers or create a feebate program - Incentives for idle reduction and aerodynamic technologies on freight	- Consumer outreach - Driver training - Benchmarking for fleets	- New financing tools - Fleet fuel management programs
Longer-term opportunities		- Incent higher performers		

DISTRIBUTED GENERATION

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Microgeneration regulations	- Climate Change Emissions Management Corporation	- Training programs	- On-bill financing
Short-term opportunities	- Require on large new buildings - Solar ready requirement - Increased municipal powers	- Provide incentives or feed-in-tariff	- Expanded training programs - Consumer outreach	- Expanded financing tools
Longer-term opportunities	- Expanded requirements			

COGENERATION & DISTRICT ENERGY

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Microgeneration regulations		- Training programs	
Short-term opportunities	- Increased municipal powers - Require in new developments where economic	- Government funding	- Expanded training programs - Consumer outreach	- Identify large heat users
Longer-term opportunities				

INDUSTRIAL FACILITIES

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Specified Gas Emitters Regulation (SGER)	- Climate Change Emissions Management Corporation - Productivity Alberta	- Benchmarking tools	
Short-term opportunities	- Broadened SGER - Require energy audits to identify cost effective opportunities	- Expanded incentives - Streamlined offset system	- Expanded benchmarking - Energy audits - Build into corporate culture	- New financing tools
Longer-term opportunities				

MECHANICAL INSULATION

Timing	Regulations	Incentives	Education	Other Tools
Current activities			- Industry outreach	- Assessment software
Short-term opportunities	- Minimum pipe insulation thicknesses	- Incentives for new installations and/or retrofits	- Expanded outreach - Facility audits	- New financing tools
Longer-term opportunities				

ENERGY PRICING

Timing	Regulations	Incentives	Education	Other Tools
Current activities				
Short-term opportunities	- Introduce a sliding scale pricing where the unit price increases as consumption increases	- Provide incentives with time-of-use metering		
Longer-term opportunities	- Energy pricing includes cost of emissions			

LAND USE AND TRANSPORTATION PLANNING & TRANSIT

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Local and some regional planning	- Transit funding	- Transit, carpooling and telecommuting promotion	
Short-term opportunities	- Increased regional or provincial planning with increased requirements for densification and mixed use	- Increased transit funding	- Increased citizen outreach	- Market based instruments (e.g., transfer of development rights)
Longer-term opportunities				

WATER

Timing	Regulations	Incentives	Education	Other Tools
Current activities	- Provincial and municipal regulations and bylaws	- Rebates for low flow devices	- Provincial and municipal outreach	- Water metering programs
Short-term opportunities	- Increase requirements for low flow devices - Permit the use of grey water and rain water	- Expanded incentives	- Increased consumer outreach	- Increased use of water metering - Pricing to encourage conservation - Market based instruments

[1] Laitner, J., V. McKinney. 2008. *Positive Returns: State Energy Efficiency Analyses Can Inform U.S. Energy Policy Assessments*. http://aceee.org/pubs/e084.pdf?CFID=2125642&CFTOKEN=86126255.

[2] Chittum, A., et. al. 2009. *Trends in Industrial Energy Efficiency Programs*. American Council for an Energy Efficient Economy. http://aceee.org/pubs/ie091.pdf?CFID=2125642&CFTOKEN=86126255

[3] Architecture 2030. 2009. *Hope Resides in the Private Building Sector.* http://www.architecture2030.org/investment/investment_plan.html.

[4] Lawrence Berkley National Laboratory. *The Profitability of Energy Efficiency Upgrades*. http://hes.lbl.gov/hes/profitable.html

[5] Enkvist, P., T. Naucler, J. Rosander. 2007. *A Cost Curve for Greenhouse Gas Reduction*. The McKinsey Quarterly, 2007, Number 1. http://www.epa.gov/air/caaac/coaltech/2007_05_mckinsey.pdf. pp. 38

[6] The potential for even greater energy efficiency improvement is exists when possibilities for future technology advancement, broader policy development and changes in behaviour are considered. Source: Energy Efficiency Working Group. 2008. *Energy Efficiency in Canada. Energy Sustainability Sector Table*. http://www.sst.gc.ca/ED717E3F-17AF-48CB-AE8D-7AC3A6FFC178/EEWG_Final_Report.pdf. pp. 5.

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