



GETTING IT RIGHT: A MORE ENERGY EFFICIENT ALBERTA

Final Report of the Alberta Energy Efficiency Advisory Panel

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LETTER TO THE MINISTER

On behalf of the Energy Efficiency Advisory Panel, I wish to place on record our sincere thanks to the many hundreds of individuals and organizations that contributed to this report. Although responsibility for the analysis and the recommendations in this report belong solely with the Panel we could not have produced the report without the enthusiasm, expertise and dedication of individual Albertans, representatives of stakeholder groups and technical experts here in Alberta, across North America and as far as the United Kingdom.

The Panel was impressed by the very high quality of written submissions from individual Albertans and experts, the insights we obtained from the research we commissioned, and the knowledge we were able to obtain from case studies that were presented to us by international leaders in energy efficiency. All of these inputs to the work of the Panel are referenced in this report and they will remain accessible to the public on the project website.

We must also acknowledge the superb job done by the Climate Change Secretariat within your department who worked with great dedication throughout the engagement to support the Panel. Every request was met with speed, professionalism and integrity, on many occasions in the personal and family time of individuals concerned. Alberta is fortunate to have such dedicated and expert staff available to support the significant transitions that are underway in the provincial economy and in the rest of Canada. This is very important work and it is good to know that public servants in Alberta can help set a clear lead for the country in our commitment to delivering a lower carbon future for Canada.

As you know, our Panel comprised independent and knowledgeable individuals who worked transparently and within the terms of an agreed code of conduct that ensured no private external influence on our deliberations or our recommendations. I believe you can be proud of their deep commitment to Alberta and to the prospect of the province becoming an international leader on questions of energy efficiency and small-scale renewable energy in the future. Our recommendations are offered independently, unanimously and in good faith to your government, and through you, in due course to the Energy Efficiency Alberta agency. But we have been clear throughout that it will be up to your office to interpret our report and our recommendations, and that the agency must determine exactly which programs are launched and when.

There is no doubt, given the evidence presented to our Panel that Albertans who have studied the issues and who have become acquainted with the opportunities recognize that significant benefits can be generated for the province with effective, performance-based and accountable programming in energy efficiency, and in the design and development of smaller-scale renewable energy systems. These benefits are economic, social and environmental in nature, and most importantly, they all represent **excellent value for money** for Albertans.

We believe our recommendations will help set Energy Efficiency Alberta up for success. Based on expert advice we have received and analyzed, we have recommended four best practice programs for launch in early 2017 that will be relatively quick to establish, are low risk and accessible to all. But these are only the first steps of programming, which in due course, must be built on a much wider portfolio of targeted programs for energy efficiency and community energy systems based on detailed analysis and market testing, and in some cases, public policy changes. Whatever programming is designed and implemented over time, the success of Energy Efficiency Alberta and achieving maximum returns on investment will be very dependent on the promise of secure multi-year funding and the early establishment of a highly trusted brand.

It has been an enormous pleasure for me to serve as Chair of the Alberta Energy Efficiency Advisory Panel.

David Wheeler

A REDUCED CARBON FOOTPRINT: “DEFINITELY A SELLING FEATURE.”

When Angela Cruickshank and family found their 1915 character home in Medicine Hat in 2001, its hardwood floors, high ceilings, moldings and trim captured their hearts. Its poor energy efficiency, confirmed in an energy audit, did not. So they sealed the house with new windows and doors; upgraded all the insulation; and installed LED lighting, programmable thermostats, low-flow faucets, and new appliances.

“Probably the most expensive thing we did was install solar panels on our garage roof,” Angela says. “However we bought and installed the panels for one-half the regular price because, at the time, we could take advantage of both city and provincial funding programs.”

She notes their electricity bills have been as low as \$20 (mostly for the fixed costs of generation and distribution.) The Cruickshank family sold their character home this year and are upgrading another one. “The upgrades we had made were definitely a selling feature. The new owners told us so.”

EXECUTIVE SUMMARY

Through the Climate Leadership Plan, the Government of Alberta is taking steps to address the challenge of climate change. *Getting it Right: A More Energy Efficient Alberta* deals with one aspect of the government's plan: the creation of Energy Efficiency Alberta, a not-for-profit Crown Agency that will support energy efficiency programs and services for homes and businesses.

To help launch Energy Efficiency Alberta, the government struck the Energy Efficiency Advisory Panel. The Panel was asked to advise on:

- A long-term vision for the goals and outcomes for Energy Efficiency Alberta;
- First-stage energy efficiency and community energy system programs; and
- Initial education and outreach initiatives.

The Energy Efficiency Advisory Panel engaged with a wide cross-section of Albertans, including individuals, Indigenous communities, educators, students, co-operatives, and municipal and industry stakeholders, to determine the types of energy savings and community energy programs that Energy Efficiency Alberta can deliver in the short term. Hundreds participated in the engagement processes, both in person and online, and expressed a keen interest in participating in the transition to greater energy efficiency and cleaner energy in Alberta. The Panel also commissioned research, reviewed case studies, and consulted with experts from around the province and throughout North America. The following recommendations emerged from these activities:

I. VISION AND OUTCOMES

1.1 Recommended Vision: Energy Efficiency Alberta is a catalyst for saving money, creating jobs and reducing emissions – all at the same time.

By 2025, Energy Efficiency Alberta will play an ongoing, central role in achieving the following outcomes:

- Alberta will be a leader in the development and delivery of programs related to energy efficiency and community energy systems.
- Albertans will embrace energy efficiency and readily access new energy-saving technologies, whether at home, school or work.
- Energy solutions will be more affordable, clean and diverse; communities will be more self-reliant, and new jobs will be created.
- Alberta will be home to a flourishing energy efficiency services industry.

- Energy Efficiency Alberta's programs, information and incentives will be an important driver in ongoing market transformation.

The Panel also recognized that reaching all Albertans in a meaningful and effective way, as well as cultivating their interest and enthusiasm, will require the development of a wide portfolio of programs.

1.2 The Panel recommends Energy Efficiency Alberta build a diversified portfolio of programs that evolves in a timely fashion.

The Panel heard that different programs can be delivered most effectively by seeking out appropriate and diverse sources of collaboration. Thus:

1.3 The Panel recommends Energy Efficiency Alberta work with a variety of actors that are well-suited to be involved in the outreach and delivery of specific programs.

2.AGENCY OVERSIGHT

A robust oversight process is required to assess Energy Efficiency Alberta's performance against targets and to help design and optimize its activities.

2.1 The Panel recommends the Government of Alberta consider the following when designing Energy Efficiency Alberta's oversight:

- Set clear reporting, approval and evaluation procedures.
- Hire third-party evaluators to assess program impacts/performance and include stakeholders in the process.
- Clearly delineate the role of government (powers and limitations).
- Support the development of strong marketing and independent branding of the agency, in addition to marketing of programs.
- Ensure transparency of information and data with links to accountability and reporting mechanisms.

2.2 To measure success, the Panel recommends Energy Efficiency Alberta track outcomes against set performance targets and indicators for both individual programs and the agency's entire portfolio. The Panel also recommends Energy Efficiency Alberta set up a formal, rigorous process to assess and report on all performance targets and indicators.

3. FUNDING

To build lasting market transformation, Energy Efficiency Alberta needs assurance of long-term funding.

3.1 The Panel recommends the Government of Alberta make a commitment to provide ongoing funding that always ensures a minimum of a rolling five-year budget (similar to that of the Climate Leadership Plan). This is a minimum time horizon to enable effective planning cycles.

3.2 The Panel recommends the Government of Alberta establish a formal interdepartmental oversight committee to ensure the effective and complementary use of all funds contributing to energy efficiency and community renewable energy in the province (i.e., funds allocated to Energy Efficiency Alberta as well as other non-agency programs).

4. EDUCATION AND OUTREACH

Education and outreach initiatives must apply at multiple levels – from high-level knowledge about efficiency and renewable energy to specific program-level understanding to formal education.

4.1 The Panel recommends Energy Efficiency Alberta develop and deliver general outreach and information programs to create Agency awareness, promote efficiency program uptake and change consumer behaviours.

4.2 The Panel recommends Energy Efficiency Alberta benchmark its budgeting for education and outreach to that of other jurisdictions.

4.3 The Panel recommends an education advisory group be established with a broad representation of stakeholders including a significant number of student leaders.

4.4 The Panel recommends Energy Efficiency Alberta undertake capacity building activities that support a wide range of Albertans to successfully participate in the development, delivery and uptake of energy efficiency and community energy systems. It is also recommended this capacity building be undertaken in a way that leverages existing programs, industry groups, professional associations, post-secondary institutions and unions.

4.5 The Panel recommends Energy Efficiency Alberta identify a clear strategy for assuring itself that communities and community-based groups can develop or have access to appropriate expertise to participate fully in Energy Efficiency Alberta programming. This includes ensuring that resources are provided for such expertise, either directly or from other agencies.

4.6 The Panel recommends Energy Efficiency Alberta develop ongoing relationships with a wide range of groups to advance energy efficiency and community energy systems so that the agency can assure programs are relevant, effective and accessible. It is recommended these relationships build on the preliminary engagement work already completed by the Panel.

4.7 The Panel recommends Energy Efficiency Alberta form a collaborative relationship with municipalities to build on existing municipal initiatives, to leverage existing capacity and funds, and to coordinate the sharing of resources and data where possible.

4.8 The Panel recommends Energy Efficiency Alberta play a supporting role in the advancement of government and non-government policies and practices that support the uptake of energy efficiency and community energy systems in the province.

5. INITIAL PROGRAMMING

In keeping with the advice received from the public, stakeholders and experts, the Panel recommends the first four programs be easy to implement, be low risk, and have immediate, measurable gains to generate public interest and uptake. The recommended programs are:

5.1 Direct Install (DI) Program

In a Direct Install program, low-cost energy efficiency products are installed in homes at no cost to consumers. Installation is conducted by qualified agents who schedule home visits. Both single-family homes and multi-family dwellings are eligible for the program, as are all income levels. Examples¹ of direct install products include LED lighting, LED night lights, smart power bars, and low-flow showerheads and aerators.

5.2 Consumer Products Program

The Consumer Products program offers incentives (point-of-sale, online or mail-in) for purchase of energy efficient appliances and electronics that are independently certified to save energy without sacrificing features or functionality. It is recommended that incentives include appliances only at the top tier of energy efficiency to maximize effectiveness. Examples of eligible consumer products include: appliances and electronics, insulation and draft-proofing products, water heaters and products included in the Direct Install program.

1. These are examples only. Actual products available through the Direct Install program or any other identified program may vary.

5.3 Business, Non-Profit, Institutions (BNI) Incentives

Incentives assist non-residential buildings (including businesses, non-profits, institutions, and co-operatives) to reduce emissions and energy use. The program offers incentives on products and on installation of energy efficiency measures. The initial core offerings would be expanded over time. Examples of products eligible for BNI incentives include lighting, heating, ventilation, air-conditioning systems and water heating.

5.4 Small Solar Photovoltaic (PV) Program

The Small Solar Photovoltaic (PV) program provides financial incentives to support the installation of solar photovoltaic systems on buildings, including homes, businesses, and community structures, under Alberta's Micro-Generation Regulation. The program will reduce greenhouse gas emissions, generate electricity at the point-of-use, and ensure reliable electricity generation for over 25 years. The financial incentive will lower the cost of installing the solar system and help ensure net financial savings on electricity.

The Small Solar PV program builds on programs already available for farms, municipalities, and Indigenous communities. This new program extends the ability to participate in solar PV to the rest of the province.

6. FUTURE PROGRAMMING – ENERGY EFFICIENCY

The Panel's recommendations for initial programming have a broad reach, are quick and relatively easy to implement, and accessible to all Albertans. Over time, Energy Efficiency Alberta must conduct research to inform future program selection and target programs to specific audiences as needed.

6.1 The Panel recommends the development of additional programming for energy efficiency similar to that of other jurisdictions pending proper assessment for applicability in the Alberta market. It is also recommended that future programs be advanced as soon as possible to maximize the benefits of these programs for Albertans in the short term.

6.2 The Panel recommends Alberta-specific market research be undertaken to inform future program selection, design and evaluation. This includes the development of a comprehensive conservation potential review for the province to guide the development of a long-term energy efficiency and conservation strategy.

7. FUTURE PROGRAMMING – COMMUNITY ENERGY SYSTEMS

To maximize contributions to renewable energy targets:

7.1 The Panel recommends at the earliest time possible the Government of Alberta identify its targets for the scale of community-owned energy systems, together with financial mechanisms consistent with achieving these targets – for example, incentives to promote their adoption through the Alberta Electric System Operator or another agency. See also Recommendations 12.1 and 12.2.

Failure to act on this recommendation will delay or limit the development of community-owned energy systems in the province. Groups expressing interest in the development of co-operatives, Indigenous communities and others, need technical, financial and regulatory certainty if they are to participate in such programs and if Alberta is to generate a significant portion of its renewable electricity target from community-owned systems.

7.2 The Panel recommends Energy Efficiency Alberta develop a program to provide financial support for initial community-owned renewable energy systems and ongoing technical support over the long term.

7.3 The Panel recommends the Government of Alberta work with Energy Efficiency Alberta and all other relevant organizations to determine how best to support community-owned renewable energy systems over the long term, consistent with Recommendation 7.1.

7.4 While the development of regulatory enabling mechanisms is beyond the scope of Energy Efficiency Alberta, the Panel recommends the Government of Alberta continue efforts to enable community-owned, renewable energy systems either through updates to the existing Micro-Generation Regulation or through new regulations.

7.5 The Panel recommends Energy Efficiency Alberta develop an approach for supporting the advancement of a broad range of community energy systems that are able to contribute to the province's climate change objectives.

8. TRANSPORTATION

While transportation was not selected for initial incentive programs, the Panel recognized that it is important to raise awareness around ways to reduce fuel use in the short term and develop a transportation-related strategy in the long term.

8.1 The Panel recommends early outreach messaging by Energy Efficiency Alberta include information on no-cost and low-cost ways to save fuel. This includes consideration of driver training outreach for fleets in the municipal, education and non-profit sectors.

8.2 The Panel recommends Energy Efficiency Alberta develop a strategy for future programming related to transportation and how it will align with the efforts of other initiatives.

9. INDIGENOUS COMMUNITIES

Indigenous communities identified jurisdictional issues, both political and operational, as barriers to adoption of energy efficiency and community energy systems. They pointed to a need for multi-government collaboration with respect to First Nations and Métis settlement infrastructure and housing.

9.1 The Panel recommends the province works in collaboration with Indigenous Communities and the federal government to define best practices in applicable codes and standards for First Nations and Métis settlement housing, including those related to the Alberta Building Code and the National Energy Code.

9.2 The Panel recommends the provincial Department of Indigenous Relations and Energy Efficiency Alberta work with communities to ensure the provision of independent technical and financial capacity at the community level to undertake energy efficiency measures and develop community energy systems, thereby instilling a pride of ownership in these initiatives and contributing to employment and economic development and diversification.

9.3 The Panel recommends the provincial Department of Indigenous Relations work with Energy Efficiency Alberta to ensure intergovernmental and interagency collaboration so that Indigenous communities can efficiently and equitably access and leverage all available energy efficiency and renewable energy related complementary funding, including funding related to housing, land use and infrastructure planning.

9.4 The Panel recommends Energy Efficiency Alberta establish a formal Indigenous advisory mechanism with representation from the Departments of Education and Economic Development and Trade, as well as relevant technical fields. Representation from Indigenous and Northern Affairs Canada would also be important to the success of the advisory mechanism.

10. ACCESS TO DATA

Access to data is critical to the design and delivery of both energy efficiency and community energy systems.

10.1 The Panel recommends the Government of Alberta develop mechanisms, including the development of a regulation, to enable Energy Efficiency Alberta to employ user-specific energy consumption data to enhance program design and delivery while maintaining appropriate privacy controls.

10.2 The Panel recommends Alberta Energy also incorporate the issue of access to data within their regulatory review process.

11. FINANCING

Financing, along with information, incentives and regulations, is one of the primary tools to advancing energy efficiency and community energy systems.

11.1 The Panel recommends Energy Efficiency Alberta investigate opportunities for innovative financing for energy efficiency and community energy systems; and support them where appropriate.

12. INTEGRATION WITH UTILITIES

There is an important role for the utility system in the advancement of energy efficiency and community energy systems in the province.

12.1 The Panel recommends Alberta Energy consider creating an energy efficiency and community energy system mandate for its utility regulator and electric system operator.

12.2 The Panel recommends Service Alberta consider adding an energy efficiency and community energy system mandate for the Utilities Consumer Advocate.

13. LINKS TO INNOVATION, RESEARCH AND DEVELOPMENT AND COMMERCIALIZATION

Alberta may achieve competitive economic advantage through the research, development and commercialization of products and services that emerge from its efforts to transition to cleaner energy.

13.1 The Panel recommends Energy Efficiency Alberta be formally represented within the new innovation structures and initiatives being developed by the Government of Alberta under the mandate of the Climate Technology Task Force through explicit governance and operational links.

13.2 The Panel recommends Energy Efficiency Alberta support the recommendations of the Climate Technology Task Force when they emerge and that ‘contribution to innovation’ be used as a potential criterion for certain programming of the agency (e.g., where community level and other demonstration projects are deemed to meet the normal criteria for programming and where long-term economic benefits may accrue).

OTHER POLICIES AND INITIATIVES

In addition to its recommendations, the Panel has noted policies and initiatives that will have a bearing on Energy Efficiency Alberta’s work, including potential changes to the Micro-Generation Regulation and anticipated changes to Alberta’s Building Codes. A more detailed listing and discussion of these items is provided in the last section of the report.

INTRODUCTION

There is perhaps no greater challenge for our planet than climate change. Climate change demands a serious response from all of us, Albertans included. Will our response be effective, capable, and perhaps even exemplary? Do we have the strategies and tools to make it so?

Through the Alberta Climate Leadership Plan, the Government of Alberta is taking steps to address the challenge of climate change. It will protect the province's health, environment and economy by:

- Phasing out emissions from coal-generated electricity and developing more renewable energy;
- Implementing a new carbon levy on greenhouse gas emissions;
- Legislating a limit on oil sands emissions; and
- Introducing a new methane emissions reduction plan.

The legislation requires that the money raised by the carbon levy may “only be used for initiatives related to reducing emissions of greenhouse gases or supporting Alberta's ability to adapt to climate change, or to provide rebates or adjustments related to the carbon levy to consumers, businesses and communities, including adjustments in the form of tax credits or tax rate reductions.”

This report supports the Government of Alberta's Climate Leadership Plan by recommending programs that can help Albertans achieve energy efficiency.

In Canada, every dollar spent on energy efficiency programs generates between \$4 and \$8 of gross domestic product.

*Federal Minister of
Environment and
Climate Change
Catherine McKenna*

WHY AN ENERGY EFFICIENCY ADVISORY PANEL?

Alberta's Climate Leadership Plan highlights the development of energy efficiency and community energy systems as an important complementary policy to the carbon levy. To help launch Energy Efficiency Alberta, the government struck the Energy Efficiency Advisory Panel. The Panel was chaired by Dr. David Wheeler. Biographical information on all members is included in Appendix B.

The Panel was asked to advise on:

- A long-term vision for the goals and outcomes for Energy Efficiency Alberta;
- First-stage energy efficiency and community energy programs; and
- Initial education and outreach initiatives.

The Panel was also asked to engage with a cross-section of Albertans, including individuals, Indigenous communities, educators, students, co-operatives, municipalities, and industry stakeholders, to determine the types of energy savings and community energy programs that Energy Efficiency Alberta can deliver in the short term.

The Panel would like to thank all those who provided input during the engagement process. The input was wide ranging and, in many cases, of greater breadth or depth of detail than could be accommodated within the Panel's recommendations. The list of individuals and organizations contributing written submissions is provided in Appendix I; these submissions will continue to be available to the public on the project website and will of course be available to the new Agency when it is established. While the Panel's recommendations focus on programming and a high-level long-term vision for Energy Efficiency Alberta, it is expected that other input provided by Albertans will be used by Energy Efficiency Alberta to inform its work going forward.

Alberta's leadership on climate change has been recognized both internationally and federally, from President Obama's recognition of the Government of Alberta's Climate Leadership Plan, to the positive and collaborative relationships Alberta has with its federal partners. Energy Efficiency Alberta has an opportunity to leverage Alberta's partnerships with federal, business and non-profit organizations.

ABOUT ENERGY EFFICIENCY ALBERTA

The Government of Alberta, through the *Energy Efficiency Alberta Act*, established Energy Efficiency Alberta as a not-for-profit Crown Agency. It is expected the agency will be operational by the end of 2016, and programs will be launched in early 2017. The agency will:

- Raise awareness among consumers about energy use and its impact on the economy and environment.
- Promote, design and deliver energy efficiency and conservation programs; and develop community energy systems.
- Promote the development of an energy efficiency and community energy services industry.

DEFINING ENERGY EFFICIENCY AND COMMUNITY ENERGY SYSTEMS

Energy efficiency means using less energy to provide the same service, often through the use of new technologies or more efficient products – for example, LED lighting versus traditional incandescent bulbs. Similarly, a low-flow shower head will cut down on the use of energy (as well as conserve water) as there is less water to heat. Energy conservation (e.g., turning off lights that are not needed) can also be considered a form of energy efficiency and is also within the mandate of Energy Efficiency Alberta. The Panel recommends the agency include energy efficiency as it relates to electricity, heating, cooling and transportation fuels for all sectors paying the carbon levy.

Community energy systems can be defined in a variety of ways. The Panel recommends Energy Efficiency Alberta consider including the following definitions of community energy systems within its scope of operations:

- Renewable and low-emissions alternative electricity generation technologies less than five megawatts.
- Community-owned electricity generating systems (of any size) involving majority ownership by Indigenous communities, municipalities, institutions (including schools), co-operatives and other non-profits.
- Heating and/or cooling technologies considered renewable or alternative energy.

For all community energy systems, the Panel recommends the agency focus on technologies and applications that create a clear net reduction in greenhouse gas emissions compared with conventional ways of producing electricity, heat and/or cooling for sectors paying the carbon levy. Examples of these technologies include solar photovoltaic (PV); solar heating; wind power; geothermal heating, cooling or power; combined heat and power systems; and district heating and cooling.

Through energy efficiency and community energy systems, Albertans can choose to:

- Reduce greenhouse gas emissions
- Save on energy bills
- Innovate with new technologies and create jobs
- Increase the comfort and value of homes, businesses and public buildings
- Live with cleaner air and improved health

Appendix C provides a comprehensive list of common energy efficiency measures and community energy technologies and practices.

ENGAGEMENT

To obtain a well-rounded perspective on the challenges and opportunities related to energy efficiency and community energy systems, the Energy Efficiency Advisory Panel engaged with many individuals and stakeholders.

METHODOLOGY AND APPROACH

A general discussion document supported all engagements, and it was available both online and at engagement sessions. The engagement process gathered input in four areas:

- What are the barriers to implementing energy efficiency and community energy systems, and how do we overcome these barriers?
- What programming tools best promote energy efficiency and community energy systems?
- What are the best measures of success?
- What energy efficiency technologies and practices should Alberta adopt?

Input from the various engagements was summarized and posted online; these summaries will continue to be available to the public on the project website and will be available to the new Agency when it is established. Engagements were held during the months of July through October, and included:

- Five open houses held in Medicine Hat, Edmonton, Calgary, Lethbridge and Grande Prairie attended by approximately 500 people.
- Three full-day technical sessions designed to give stakeholders an opportunity to share their perspectives in these areas: buildings; program design and implementation; and community energy systems. The sessions were attended by stakeholders from the private and public sectors as well as think tanks and industry organizations.
- Municipal sessions were attended by 41 municipal representatives. Six municipalities presented overviews of their own energy efficiency and community energy systems.
- A separate youth and educator engagement session with 52 participants including teachers, students, school board trustees, non-governmental organizations, not-for-profit organizations and the private sector. The session consisted of several presentations including those made by three schools in Edmonton, Calgary and Fort McMurray, recognized as leaders in the adoption of energy efficiency and community energy systems.

- Six sessions with Indigenous communities in Edmonton, Fort McMurray, Calgary, Grande Prairie, Maskwacis and Enoch Cree Nation. Panel members also participated in conferences hosted by the Assembly of First Nations and the Technical Services Advisory Group to provide information on the engagement process and Energy Efficiency Alberta. In addition, the Panel received a submission from the Métis Nation of Alberta.
- Panel members also heard from members of the non-profit and voluntary sector on the unique challenges and opportunities of the sector.



WHAT WE HEARD

A significant majority of those who provided input to the Panel – both in engagement sessions and online – did so with a keen interest in taking action to reduce their carbon footprints. They shared a wide array of opinions, ideas and concerns, and all have been considered in the development of this report. A common theme was that “we are all in this together” and it will take a united effort to capture the full potential of energy efficiency and community energy systems in the province.

Barriers

Participants in all sessions cited barriers to adoption of energy efficiency and community energy systems. Lack of awareness is considered a barrier, as is the perception that some systems have high startup costs and uncertainty regarding returns on investment. Participants in the public sessions said the implications of daily energy use, positive and negative, are not easily understood. Technical knowledge and expertise are not readily available, and many people do not know where or how to begin to use less energy.

Participants in public sessions also said the way the electricity grid is currently structured is an impediment to getting community energy systems started. A lack of enabling regulations, few or inadequate incentives, and issues related to split incentives² were cited as additional barriers.

Making people aware of what is available is a good start. Maybe you can have people who come to your home to show you where you are losing or wasting energy.

– Public comment (online submission)

Technical experts identified additional barriers, including:

- Building codes and standards that have not promoted energy efficiency.
- The need to verify energy savings.
- Uncertain program funding over time (key to Energy Efficiency Alberta's ability to create savings over the long term).
- The need to translate complex issues of energy efficiency and community energy systems into language that is compelling for consumers.

Many people want to buy into the fundamental change in our society that is underway; they want to help to address the climate change issue. They simply don't know how.

– Alberta Geothermal Energy Association (online submission)

Participants in both the technical and municipal sessions expressed concerns about lack of data – how, where and when energy is used and by whom – for developing proper indicators to measure energy efficiency.

Many small municipalities said they have neither the technical expertise nor the money to identify opportunities for energy efficiency. They expressed interest in information sharing and the development of a clearinghouse for education and tools related to energy efficiency and community energy systems.

2. Split incentives are a barrier to the deployment of energy efficiency measures in buildings. Split incentives occur when those responsible for paying energy bills (the tenant) are not the same entity as those making the capital investment decisions (the landlord or building owner). In these circumstances, the landlord may not be inclined to make the necessary upgrades to building services when the benefits associated with the resulting energy savings accrue to the tenant.

Keep the programs simple. Choose projects that will have the greatest certain impact on energy efficiency. Grant funding should be upfront and part of a long-term strategy. That way municipalities can plan and budget for their share of costs.

– Municipal representative comment (Municipalities technical session)

Students, trustees and educators identified three main barriers to learning more about energy efficiency in school:

- Teachers need professional development to gain a better understanding of the benefits of conserving and producing energy.
- There is not enough time within the curriculum to explore additional subject matter.
- Study related to energy efficiency would probably involve field trips and projects; school boards are increasingly sensitive to costs and potential liabilities.

It's important to provide support – financial, resources, expertise, to enable the exceptional on-the-ground work being done by schools and school districts to move toward a sustainable future.

– Educator comment (Youth and educator engagement session)

Indigenous communities expressed profound concerns over climate change and its impact on the environment. While they support the adoption of energy efficiency and community energy systems, they identified barriers, many in keeping with what other groups reported, and some unique to their communities. Indigenous communities identified jurisdictional issues, both political and operational, as barriers to adoption of energy efficiency and community energy systems. They pointed to a need for i) dedicated in-community independent expertise for equitably accessing and delivering programming; and ii) intergovernmental/interagency collaboration with respect to improving First Nations and Métis Settlement infrastructure and housing by ensuring clear channels to coordinated funding opportunities.

The non-profit and voluntary sector identified a strong need to update aging infrastructure to be more functional and energy efficient. However, they pointed to limited access to capital for upfront investment as a barrier to doing this.

Programming Tools and Options

All participants said education and outreach are critical to the adoption of energy efficiency and community energy systems. Greater energy literacy, including a deeper understanding of one's own energy use, will lead to greater program participation in the short term and, ultimately, market transformation. And while reducing greenhouse gas emissions is a priority, participants said awareness programs must also focus on cost savings and other benefits.

Much of the discussion in the public realm has been to lower emissions for the sake of the environment. The 'environment' can be a very abstract idea; some people relate that term to glaciers and waterways, others to their personal garden and family pet. More effort is needed to educate the public on the benefits of well-designed homes and commercial buildings.

– Public comment (online submission)



Public participants expressed interest in solar energy (both for individuals and community systems), and energy efficiency tools like thermostats, LEDs and energy audits.

They also recommended the use of incentives to increase adoption of energy efficiency and community energy systems. Incentives could take multiple forms, including direct grants or loans, indirect tax breaks or rebates.

Those participating in the technical sessions recommended implementing standards, regulations and other policy tools to maximize efficiency. Examples included performance standards for equipment and appliances, and enhanced building codes. Distribution utilities indicated their support for energy efficiency programs, and cited the need to account for them properly within the utility regulatory system. There was a range of perspectives on how the utilities could support outreach and delivery of energy efficiency programming.

Because cost was cited as a barrier to the adoption of community energy systems like solar power, technical experts suggested the use of a long-term revenue certainty and financing to drive uptake of these systems.



Municipalities highlighted the unique role they can play as local governments to help deliver energy efficiency and community energy systems programming. See also online submissions from the City of Medicine Hat, the Alberta Urban Municipalities Association and the Alberta Association of Municipal Districts and Counties. Many municipalities across the province have been demonstrating leadership on energy efficiency and climate change.

Many municipalities have implemented successful energy efficiency and community energy programs and can assist in promoting and delivering programs at the local level.

– Alberta Urban Municipalities Association (online submission)

To further enable collaboration, municipal representatives recommended provincial programming be coordinated with that of municipalities. They recommended developing a roadmap to coordinate programs, and reduce redundancies and overlaps. They suggested a clear mandate for municipalities, perhaps as a program delivery agent. They also recommended resources be developed and shared with municipalities as a means of enabling those communities with fewer resources to also play a meaningful role.

Funding and resource supports dedicated to empower municipalities in implementing policy and operational improvements will benefit local communities and strengthen Alberta's action taken to address climate change impacts. To increase capacity, municipalities would benefit from having additional resources available in the form of staff support, predeveloped toolkits, and access to approved vendors to implement energy efficiency improvements.

– Alberta Association of Municipal Districts and Counties (online submission)

Students and educators said energy efficiency should be part of the core curriculum, and professional development on this topic should be offered to teachers. They also recommended the creation of an energy efficiency expert group to assist with building energy efficiency capacity in school districts.

This work is important. Short term costs are of minimal consequence to the long-term integrity of humanity's legacy . . . Education is the way to create a social movement of environmental responsibility.

– Educator comment (Youth and educator engagement session)

Indigenous communities said programming must be unique to individual community needs and sustainable over the long term. Additionally, programming should address issues where energy costs are not associated with home occupants, and must ensure the provision of education that supports energy efficiency and promotes pride in ownership of infrastructure and facilities. Indigenous representatives identified the importance of engaging elders and youth in discussions that encourage support for change at the community level.

The not-for-profit and voluntary sector said capacity building and support are necessary to assist the sector to participate in programming. See for example, an online submission from the Calgary Chamber of Voluntary Organizations at climate.alberta.ca.

Regarding transportation, feedback suggested the use of rebates for alternate fuel vehicles, electric vehicles, zero or low emissions vehicles, hybrid vehicles and fueling or charging stations.

Direct partnership between Energy Efficiency Alberta and municipalities will be required for activities such as installing charging stations for electric vehicles on municipal rights-of-ways. Adjustments to municipal policies and bylaws may be required to successfully enable activities that reduce emissions such as the installation of solar panels.

– Alberta Urban Municipalities Association (online submission)

Defining Success

Participants said that, to achieve success, Energy Efficiency Alberta must first and foremost be recognized as an “honest broker” – a credible, timely, and reliable source of information and programming. Participants said engaging diverse stakeholders on an ongoing basis will help build that reputation, provide important input that informs the Agency’s decision-making, and improve and modify programs to meet consumer needs.

Public participants and technical experts identified the following key success measures:

- Measurable greenhouse gas reductions.
- Energy and cost savings.
- Program uptake and participation.
- Widespread benchmarking and reporting of energy use reductions.
- Number of jobs created provincially and regionally.
- Degree of awareness of energy efficiency and community energy systems.

- Adoption rate of new and effective technologies.
- Access and reach of programs into all sectors and regions of the province, including low-income, Indigenous and non-profits.

Public members also cited the number of households participating in programs, more renewable energy on the Alberta electricity grid, and reduced vehicle use as evidence of success.

Technical experts recommended the use of enhanced building codes and standards³ and long-term program funding as contributors to success. Undertaking an Alberta-specific study on conservation potential was discussed as an important part of selecting and designing programs.

Municipal and education stakeholders agreed with the success measures mentioned above. Municipalities reinforced the need to ensure programs and information is relevant and available to rural municipalities, as well as urban ones.

Success may be defined differently for each First Nation or Métis Settlement depending on variables such as location, economic factors and the views of leaders, as well as the need to recognize different Treaty and Settlement agreements regarding territories. Success for Indigenous communities will be the development and adoption of broad standards for improved energy infrastructure and housing for First Nations and or Métis Settlements in order that they may equitably obtain the benefits of energy efficiency and community renewables.

In all cases, participants said program results must be measured and verified, as transparency and accountability are important for program performance and public buy-in.

Program outcomes need to consider several factors: cost-effectiveness, socioeconomic impacts, and regional diversity. Simply focusing on cost-effectiveness will isolate certain stakeholder groups, including lower income Albertans.

– Technical expert (Program and Design technical session)

Program Design Considerations

In determining which technologies and practices should be included in potential programs, public participants cited cost, and cost savings as important factors, particularly costs related to start-up and technology, and cost savings resulting from the implementation of energy efficiency and community energy savings.

3. It should be noted that some of the recommended programming options and technologies fall within the mandate of other areas of government, and not the Agency itself. For example, the provincial government has already committed to timely adoption of the National Building Codes when they are updated.

As such, participants suggested early programs be easy to implement, be low risk, and have immediate, measurable gains to generate public interest. They also suggested short-term programs focus on financial incentives for energy efficiency, while long-term programs focus on enabling cultural shifts and transformation to the efficient use of cleaner, renewable sources of energy. In addition to being cost-effective and driving change, participants said Agency programs should:

- Be easy to access,
- Build on existing programs, where possible,
- Allow for flexibility,
- Reward collaboration, and
- Be described in plain language.

When discussing technology, respondents said ease of use is key. Several people stated that programs should be “technology neutral” and based on greenhouse gas reduction performance. There was considerable public support for community and small-scale system development. It was also noted that certain programs may not always be the most cost-effective, but they may have important socio-economic outcomes (e.g., support for low-income households). Both public and technical experts identified programs and products to advance energy efficiency measures:

- Energy audits,
- Programmable thermostats, low-flow faucets and kits for low-income homes,
- Retail incentives to influence behaviours,
- Building assessments and retrofits,
- Improved commercial lighting, building tune-ups and assessments,
- New home construction (‘beyond code’),
- Improved insulation and energy efficient furnaces,
- Energy assessments on farms, and
- The presence of on-site energy managers.

Technical experts also suggested making data available to consumers, including data that allows consumers to compare their energy use to that of others as a way of influencing behaviour related to energy consumption.

Similarly, the public and technical experts identified programs and focus areas to advance the adoption of community energy in Alberta:

- Small-scale renewable electricity initiatives should focus on building-associated solar PV due to the accessibility and reliability of the technology.
- For proven technologies, funding or long-term revenue certainty is necessary to increase adoption rates.
- Financing tools are required for larger systems with significant up-front capital costs.
- There is a need to improve regulatory ease of installing larger systems.
- Newer technologies and opportunities could be explored and could be informed by pilot projects in Alberta and other jurisdictions.

In the longer term, those involved with developing community energy systems – co-operatives, distribution companies, Indigenous communities, municipalities, businesses and others – need to be supported through initiatives such as:

- Some form of long-term revenue certainty.
- Examining opportunities with legacy assets and unused land for generation.
- Using pilots/demonstration projects to experiment with technologies and programs.
- Looking at the results of pilot/demonstration projects in other jurisdictions.
- Designing program roadmaps for different sectors.



To facilitate community small-scale renewable generation, the need exists for a mechanism that allows communities and co-operatives, as well as individual entities, to pursue the benefits of distributed generation through renewable energy investment.

– Comment from Community and Co-operative Owned Renewable program (online submission)

Municipalities reinforced the need for collaboration between the province and themselves in the delivery of programs, as many municipalities already have programs to support energy efficiency and community energy systems.

Students and educators noted there are good examples of innovative energy solutions within the school system, and suggested Energy Efficiency Alberta may want to work with the education system to promote greater learning.

Indigenous programming may need to address foundational community infrastructure needs, including housing, prior to launching programming that will deliver measurable savings or greenhouse gas reductions.

The non-profit and voluntary sector suggested it could work with Energy Efficiency Alberta on the development and hosting of new programs. They suggested partnership financing models should be explored as should economies of scale for the whole sector.

With one of the world's largest network of cooperatively owned rural utilities, Alberta co-operatives can play a significant role in our renewable energy future

– Co-operative Renewable Energy Coalition (online submission)



OTHER SOURCES OF INFORMATION

CASE STUDIES

Case studies were requested and reviewed by the Panel, including those of Nova Scotia's EfficiencyOne, Energy Trust of Oregon, and the Climate Change and Emissions Management Corporation, all of whom have direct experience in the energy efficiency or community energy field. A full list of the organizations requested to present case studies is attached in Appendix E.

These are some of the most important things the Panel learned from the case studies:

Consumer education is a significant factor in achieving program participation and overall success; it should not be underestimated.

Ongoing stakeholder engagement will be the foundation of future partnerships and ongoing interest in the Agency's efforts.

Cultivating valuable partnerships with contractors, engineers, architects, realtors and other professionals is important and it grows local businesses.

– Energy Trust of Oregon

Not all energy efficiency programs are accessible to all consumers and, as a result, most jurisdictions have implemented programs that specifically target low-income households.

Stability of funding and government support is key to the long-term viability of Energy Efficiency Alberta. The Agency must be further supported by committed, talented and innovative staff.

A balanced and diversified portfolio of programs is essential. Any single program has strengths and weaknesses that need to be complemented by other program approaches to magnify their overall effectiveness.

About 255,000 families in Alberta live in energy poverty—that is roughly one in six households.⁴ These families are unable to maintain 'adequate' energy services – those safeguarding health and well-being – at reasonable cost. They often face difficult choices between competing necessities such as energy, water, food and clothing. Improved efficiency is an important way of alleviating these challenges.

4. All One Sky Foundation

Projects must accomplish multiple objectives (e.g., emissions reductions, fuel savings, other environmental and economic benefits) to interest consumers. Results must be measured and validated to ensure the Agency is delivering programs that optimize these objectives.

In the past five years alone, the energy efficiency industry in Nova Scotia has grown to employ more than 1,000 people. These are meaningful, full-time jobs in both urban and rural areas of the province.

– EfficiencyOne (case study)

Investigating new measures or program activities by testing and evaluating prior to a full-scale offering can increase both internal and external understanding, help to clarify and coordinate roles and prioritize opportunities.

Information sharing is critical to the advancement of new technologies and programs.

Partnering with established businesses can provide access to large networks of existing customers, and connect customers to relevant programs and services.

Energy Efficiency Alberta must have a good understanding of clients' needs in the different sectors and target programs to support them.

ADVICE ON PROGRAM DESIGN

Throughout its deliberations, the Panel received technical advice from Dunskey Energy Consulting. See appendices H(a, c, d and e). The company provided an analysis of a range of program options related to:

- Residential programming, including but not limited to: energy audits, lighting, direct install programs, new home construction, consumer products, and solar PV systems.
- Commercial, institutional and industrial programming: energy efficiency opportunities for small businesses, non-profits, and medium-sized industrial facilities.
- Cross-sectoral programming: energy efficiency and community energy system opportunities for communities including Indigenous communities, low-income households, and the transportation sector.

ADVICE ON OUTREACH ACTIVITIES

The Panel asked EfficiencyOne⁵ of Nova Scotia to provide advice for developing a robust marketing and communications strategy that employs a variety of tools, including actions to:

- Promote the cost savings and environmental benefits of implementing energy efficiency.
- Position Energy Efficiency Alberta as the ‘go to’ energy efficiency agency in the province, a reliable source of information and programming.
- Seek out and form strategic partnerships.
- Reinforce the message of energy efficiency by celebrating what Albertans are already doing.

See Appendix H(f).

COORDINATION WITH OTHER GOVERNMENT DEPARTMENTS

The Panel also reviewed other government programs and initiatives that have a bearing on energy efficiency including the Green Infrastructure Program, renewal of the Micro-Generation Regulation, Growing Forward 2 (Appendix E, Alberta Agriculture and Forestry case study) and government support for the Municipal Climate Change Action Centre. Appendix E contains a list of energy efficiency programs operating in Alberta.

5. EfficiencyOne is located in Nova Scotia and delivers efficiency programs and services to a variety of clients including governments, public institutions and industry.

SOLAR POWER – A PRIME RESOURCE FOR ALBERTA

Theo and Esther Slingerland have owned their farm and corn maze for over 20 years and recently decided to make it even greener by taking advantage of southern Alberta's sunshine.

The couple approached a local solar company in May and the solar panels were installed on the roof and south side of their barn. Since then, the farm and the two houses on the Slingerland's property have been completely self-sufficient.

"In the summer we had enough to power everything . . . freezers, fridges, microwaves, fans and all the things we use on the farm," said Theo. "For years the price was a little out of range. In the last few years the price for solar panels has come down and there is a little bit of funding from the government."

With the help of the provincial government's Emissions Management Fund and the Growing Forward 2 program, the Slingerlands installed 30 solar panels at 250 watts each.

Supporters believe the expansion of solar energy in Alberta not only allows for a greener future but will also create jobs, in addition to electricity and revenue in the community.

- Excerpt from Global News Report, Sept. 12, 2016

RECOMMENDATIONS

The following recommendations build on input received from the public and stakeholders, a review of research and best practices and the deliberations of the Energy Efficiency Advisory Panel.

The Panel would again like to thank all those who provided input during the engagement process. The input was wide-ranging and, in many cases, of greater breadth or depth of detail than the ultimate Panel recommendations. While the Panel's recommendations focus on initial programming and a high-level long-term vision for Energy Efficiency Alberta, it is expected that other input provided will be used by the Agency to inform its work going forward.

I. A VISION FOR ENERGY EFFICIENCY ALBERTA

Energy Efficiency Alberta is the first agency of its kind in the province. Expectations for the agency are high – not only will its actions contribute to the government's climate change goals for 2030, it will also serve as a model for engagement with Albertans, stakeholders and Indigenous communities.

As previously noted, one of the Panel's duties was to recommend a long-term vision and outcomes for Energy Efficiency Alberta. The Panel recognizes the following vision may be modified once the Agency begins operation:

1.1 Energy Efficiency Alberta is a catalyst for saving money, creating jobs and reducing emissions – all at the same time.

By 2025, Energy Efficiency Alberta will play an ongoing, central role in achieving the following outcomes:

- Alberta will be a leader in the development and delivery of programs related to energy efficiency and community energy systems.
- Albertans will embrace energy efficiency and readily access new energy-saving technologies, whether at home, school or work.
- Energy solutions will be more affordable, clean and diverse; communities will be more self-reliant and new jobs will be created.
- Alberta will be home to a flourishing energy efficiency services industry.
- Energy Efficiency Alberta's programs, information and incentives will be an important driver in ongoing market transformation.

Creating a culture of efficiency in Alberta is a long-term vision, however, the Panel has identified short-term success factors that will set the Agency up for success. The Panel has identified a number of key areas that will support successful operations in the Agency's early days:

- Ease of programming – programming that is easily accessible to all Albertans.
- Broad outreach – raising awareness of recommended actions, their benefits and supporting programs is critical to driving participation.
- Honest broker – develop the Energy Efficiency Alberta brand as an independent, trusted source of information and support.
- Human capital – developing local capacity to deliver the services needed to undertake energy efficiency upgrades and develop local energy systems.
- Performance based – delivering cost-effective energy savings and reducing greenhouse gas emissions.

THE ROLE OF RENEWABLES

Thirty per cent of the province's electricity will come from renewable sources such as wind, hydro and solar by 2030. In addition to reducing greenhouse gas emissions, the government anticipates this target will generate \$10.5 billion in new investment and 7,200 new jobs.

- Accountability – using third-party evaluators and transparent processes to demonstrate whether Energy Efficiency Alberta is delivering tangible benefits for Albertans.

Achieving short-term success in these areas will help Energy Efficiency Alberta make the case for long-term, stable funding so that it can continue to deliver solid returns on investment for Albertans.

Agency Model

The Energy Efficiency Advisory Panel commissioned research on the various models for the delivery of energy efficiency programs by independent agencies, government and utilities, before confirming the best practice model chosen by the Government of Alberta [e.g., an arms-length, not-for-profit agency, see Appendix H(b)].

Given Alberta's market consisting of generators, distributors, and retailers, Energy Efficiency Alberta is best positioned to coordinate programs across all sectors and fuel types. In fact, this is a model that other Canadian jurisdictions have already adopted or are now moving towards (such as, Manitoba, Quebec). The Panel also recognizes that other

entities such as utilities, product and service providers, and municipalities can play valuable roles in outreach and program delivery. See, for example, the online submission from EPCOR at climate.alberta.ca.

A Portfolio of Programs for the Long Term

The focus of this document is on recommendations for programs that can be launched in early 2017. However, these programs are only the beginning. Reaching all Albertans in a meaningful and effective way, as well as cultivating their interest and enthusiasm, will require the development of a wide portfolio of programs:

- Other jurisdictions commonly present complementary programs that target different audiences (e.g., homeowners, renters and landlords, low-income households, multi-family buildings, co-operatives, Indigenous communities, small and medium-sized businesses, large businesses, non-profit organizations, institutions and the transportation sector).
- They also use different approaches (e.g., general information, user-specific benchmarking, incentives, financing, training, engaging stakeholders, industry capacity building, supportive regulatory changes and long-term market transformation).

1.2 The Panel recommends Energy Efficiency Alberta build a diversified portfolio of programs that evolves in a timely fashion.

It was also identified during the Panel's deliberations that a typical approach to delivering programs is to work with other organizations to maximize program effectiveness. This can take the form of hiring organizations through a competitive procurement process or identifying organizations or sectors to work with that are particularly well-suited to engage a target audience (e.g., product and energy retailers or wholesalers, municipalities and institutions, associations, other existing professional, organizational or personal networks).

1.3 The Panel recommends Energy Efficiency Alberta work with a variety of actors that are well-suited to be involved in the outreach and delivery of specific programs.

Alberta should actively seek to benefit from the experience of other jurisdictions which have decades of experience with demand-side management.

– ATCO (online submission)

2.AGENCY OVERSIGHT

A robust oversight process is required to assess the performance of Energy Efficiency Alberta against certain targets and to help design and optimize its activities.

2.1 The Panel recommends the Government of Alberta consider the following when designing Agency oversight:

- Set clear reporting, approval and evaluation procedures.
- Hire third-party evaluators to assess program impacts/performance, and include stakeholders in the process.
- Clearly delineate the role of government (powers and limitations).
- Support the development of strong marketing and independent branding of Energy Efficiency Alberta, in addition to marketing of programs.
- Ensure transparency of information and data with links to accountability and reporting mechanisms.

See also Appendix H(c). With a robust oversight process in place, the next question becomes: What is success?

2.2 The Panel recommends Energy Efficiency Alberta track outcomes against set performance targets and indicators for both individual programs and the Agency's entire portfolio. The Panel also recommends Energy Efficiency Alberta set up a formal, rigorous process to assess and report on all performance targets and indicators.

Examples of potential performance targets and indicators include energy savings, cost savings, greenhouse gas reductions, cost-effectiveness, job creation, market transformation metrics (e.g., through contributions to innovation) and regional and socioeconomic impact and reach of programs. For example, see Appendix H(c).

It is recognized that a thorough assessment of program potential will need to be undertaken before these targets and indicators are selected and set.

3. FUNDING

Based on previous experience with energy efficiency and community energy system programs in Alberta and in other jurisdictions, it has been identified that stable long-term funding is essential to create cost-effective and lasting results. For example, see Appendix H(d). This will give the Agency the certainty it needs to plan and implement effective programming and in turn, it will demonstrate a clear commitment to those individuals and organizations that participate in Agency programs and activities. Other organizations will be able to confidently plan for energy efficiency and community energy systems in their own operations, including taking advantage of opportunities, collaborating in programming, or hiring and training staff to deliver energy efficiency and community energy system services.

3.1 To support the long-term operation of Energy Efficiency Alberta, the Panel recommends the Government of Alberta make a commitment to provide ongoing funding that always ensures a minimum of a rolling five-year budget (similar to the Climate Leadership Plan budget). This is a minimum time horizon to enable effective planning cycles.

The Agency and all parts of the provincial government should work collaboratively to establish budget levels consistent with outcomes, performance and the long-term vision for energy efficiency and community energy in Alberta.

3.2 The Panel recommends the Government of Alberta establish a formal interdepartmental oversight committee to ensure the effective and complementary use of all funds contributing to energy efficiency and community renewable energy in the province (e.g., funds allocated to the Agency as well as other non-Agency programs).

This committee (or another complementary mechanism established by the Agency) should ensure opportunities for leveraging investments from all orders of government and the private sector are constantly reviewed and pursued. It should also ensure consumers and communities can access multiple sources of available funding for efficiency and community energy schemes where possible.

4. EDUCATION AND OUTREACH

In engagement sessions, the Panel heard that education and outreach are vital to effective programming and larger market transformation. They are critical to everything the Agency does, whether building awareness and energy literacy or developing and delivering programs. Education and outreach initiatives must apply at multiple levels – from high-level knowledge about efficiency and renewable energy to specific program-level understanding to formal education.

Broad Outreach

Albertans said they want to be part of the transition to a more energy efficient province, but they need to know how to take action. Energy Efficiency Alberta must increase awareness of energy efficiency and community renewables if it wants Albertans to access its programs. Communications should be three-fold:

- Energy Efficiency Alberta must make Albertans aware of its existence as a central source of information, programming, and support.
- To encourage long-term change, Energy Efficiency Alberta must communicate the benefits of energy efficiency as they relate to cost savings, job creation, economic resiliency, and reduction in greenhouse gas emissions.
- Energy Efficiency Alberta must employ both general and program-specific messaging to motivate consumers to adopt energy efficiency, and encourage them to sign up for Agency programs.

4.1 The Panel recommends Energy Efficiency Alberta develop and deliver general outreach and information programs to create Agency awareness, promote efficiency program uptake and change consumer behaviours.

The Panel recognizes these efforts will cost money. As such, a percentage of the Agency's funding must be dedicated to education and outreach.

Investment in creating awareness has helped build a culture of energy efficiency in Nova Scotia. While providing rebates and other incentives is critical to help Nova Scotians take action on energy efficiency, it must always be balanced with robust investment in marketing and outreach initiatives that help educate and inspire Nova Scotians to embrace energy efficiency as a new way of thinking.

4.2 The Panel recommends Energy Efficiency Alberta benchmark its budgeting for education and outreach with that of other jurisdictions.

Eventually, Energy Efficiency Alberta will need to report publicly on its performance and energy savings. It is suggested this reporting also include information on cost savings, job creation, emissions reductions and capacity building, as well as case studies or stories that demonstrate the contributions energy efficiency and community energy systems are making to the lives of Albertans.

Formal Education (K-12, post-secondary)

Case studies affirmed consumer education is the biggest factor in achieving success with energy efficiency programs. Extending this approach to the formal education system itself will arm future generations with a deeper understanding of energy efficiency and its benefits, and it will make them ambassadors for responsible energy use.

These initiatives will require the support of both Alberta Education and school boards, trustees, teachers and, most importantly, students and youth. For example, see online submissions from the Alberta Council for Environmental Education⁶ and from the Calgary Board of Education. Areas for collaboration that have already been identified include:

- Alberta Education's review of the school curriculum, currently underway.
- Innovative learning and student demonstration projects.
- Energy-saving initiatives within school infrastructure.

Schools can also show climate leadership by reducing their consumption of resources. We think there should be a focus on making a greener school or a way in naturalizing it. We believe that small everyday changes make significant impacts.

– Supporting Climate Leadership in Alberta Schools: Recommendations by students for Alberta's Educational Leaders, June 2016

6. A particularly relevant contribution in this area was published by the Centre for Global Education and released in June 2016: *Supporting Climate Leadership in Alberta Schools: Recommendations by students for Alberta's Educational Leaders*.

4.3 The Panel recommends an education advisory group be established with a broad representation of stakeholders including a significant number of student leaders.

The group would work to help identify opportunities for climate leadership at all levels of Alberta's education system.

Capacity Building (professional, post-secondary, organizational)

A goal of Energy Efficiency Alberta is to increase the capacity of the energy efficiency and community energy services industry alongside capacity development for individuals and organizations. Capacity development can take the form of post-secondary education and training, professional development and training activities, conferences and other events, and direct outreach that is customized to a specific audience. These provide excellent opportunities for a wide range of Albertans to participate in the advancement of energy efficiency and community energy systems as part of their job, as a new career or as a consumer or volunteer.

4.4 The Panel recommends Energy Efficiency Alberta undertakes capacity building activities that support a wide range of Albertans to successfully participate in the development, delivery and uptake of energy efficiency and community energy systems. It is also recommended that this capacity building be undertaken in a way that leverages existing programs, industry groups, professional associations, post-secondary institutions and unions.

It should be noted that capacity development activities should be targeted not only at the energy efficiency and community energy industries, but also at related services that provide support. These services include but are not limited to: technical, financial, insurance, regulatory, human resources and communications.

Given the experience of other jurisdictions, it is also important that Energy Efficiency Alberta identify ways that communities and community-based groups can i) develop capacity and, or ii) access specific expertise to participate fully in energy efficiency and community energy systems. For example, see online submission from the Pembina Foundation. This may include the development of technical expertise within communities or associations of communities, the embedding of temporary expertise within organizations on secondment from Energy Efficiency Alberta or other bodies, or simply the provision of accessible technical, environmental, regulatory or financial advice from an authoritative and independent source. This point was raised by small municipalities, Indigenous communities, co-operatives, non-profits and others.

4.5 The Panel recommends Energy Efficiency Alberta identify a clear strategy for assuring itself that communities and community-based groups are able to develop or have access to appropriate expertise to participate fully in Energy Efficiency Alberta programming. This includes ensuring that resources are provided for such expertise, either directly or from other agencies.

Ongoing Engagement

It is important for Energy Efficiency Alberta to have an ongoing relationship with different groups, both formal and informal, to build the effectiveness of its programs and support participation in the advancement of energy efficiency and community energy systems. These groups may include product and service providers, business associations and utilities, Indigenous communities, co-operatives, and non-profit organizations and institutions that support end-users or program implementation. Positive ongoing engagement will create champions for energy efficiency, helping to build top-of-mind awareness of services and programs.

4.6 The Panel recommends Energy Efficiency Alberta develop ongoing relationships with a wide range of groups to advance energy efficiency and community energy systems so that the Agency can assure programs are relevant, effective and accessible. It is recommended that these relationships build on the preliminary engagement work already completed by the Panel.

4.7 The Panel recommends Energy Efficiency Alberta form a collaborative relationship with municipalities to build on existing municipal initiatives, to leverage existing capacity and funds, and to coordinate the sharing of resources and data where possible.

There are also a wide range of government and non-government policies and practices that could support the uptake of energy efficiency and community energy systems within Alberta, but are not within the power of the Agency to change itself (e.g., energy codes for buildings, utility system regulations, municipal and industry policies and practices). That does not mean, however, that the Agency should not play a role in conversations about these enabling mechanisms. In fact, the Agency will be ideally placed to be an important part of these processes given its expertise and relationships with all interested parties.

4.8 The Panel recommends Energy Efficiency Alberta play a supporting role in the advancement of government and non-government policies and practices that support the uptake of energy efficiency and community energy systems in the province.

A lack of awareness of the benefits of renewable energy is recognized as a barrier for its uptake. Partnership with organizations whose mandate includes education is considered a favourable strategy

– Alberta Solar Co-op (online submission)

STUDENTS TAKE CHARGE OF THEIR FUTURE WITH SMART METERING

A school can save three to five per cent on energy consumption with smart meters – thousands of dollars annually.

Back in 2011, Queen Elizabeth High School became the first school in Canada to install solar panels. The installation was part of a hands-on project called “Innovate” to teach students about energy. Students then began to explore ways of enhancing their use of solar energy.

“Instead of time consuming and costly measures to install more panels, we looked at ways of reducing energy consumption,” said Aaron Dublenko, Innovate coordinator for Queen Elizabeth and Argyll schools. “We turned to smart metering. That way we could monitor electrical use in real time, the carbon emissions equivalent, and the cost to taxpayers to operate a building.” The students use an improved smart technology called Circuit Meters, invented by Dan Seto, an entrepreneur in Toronto. They then drafted projects and found City of Edmonton staff to work with. “The students presented to facilities managers, who were immediately on board. They became our community partners.”

The students have presented at many conferences, including those attended by educators, facilities managers, businesses, and decision-makers interested in climate change. They demonstrated that a school can save three to five per cent on energy consumption with these smart meters – thousands of dollars annually.

This year, more students will install this technology in their schools and begin to do energy audits in response to the new carbon levy.

“This levy promotes innovative ways of learning about climate change through energy use, policy and renewable energies,” said Dublenko. “Innovate students are encouraged to become agents of change and take charge of their energy futures. The goal with these projects is to help raise generations of energy-literate Albertan citizens and connect them to career pathways in sustainable development.”

5. INITIAL PROGRAMMING

The Panel was asked to recommend energy efficiency and community energy system programs that can be launched by Energy Efficiency Alberta in early 2017. Based on technical analysis undertaken by Dunskey Energy Consulting [see Appendix H(a)] and rigorous cross-referencing with technical and other stakeholder advice, the Panel determined that early programs must align with the following criteria:

- **Cost-effectiveness:** Programs should produce good results (real energy savings and greenhouse gas reductions) in a cost-effective way.
- **Equity:** Selected programs and resources should be broadly available across sectors and across the province.
- **Speed to launch:** Initial programs should be launched in a timely manner so consumers can start adopting energy efficiency measures right away.
- **Public interest:** Programs should stimulate public interest and participation.
- **Potential risks:** Programs should be low risk.

The Panel recommends Energy Efficiency Alberta first launch the following programs:

- 1. Residential Direct Install (DI)**
- 2. Consumer Products**
- 3. Business, Non-Profit, Institution (BNI) Incentives**
- 4. Small Solar PV**

Collectively, these four programs have a relatively quick speed to launch, and they are considered cost-effective in both reducing emissions and saving consumers' money. As important, the benefits of these programs are available to all Albertans, regardless of income, sector or geography. Each program would include significant elements of education and outreach, included as part of the detailed design work prior to launch. Over time, these programs would be supplemented with offerings that increase the breadth and depth of programming of the Agency.

Programs should ensure all Alberta households and organizations can participate. This builds broad understanding of energy efficiency and management opportunities over the long term, and takes advantage of high potential retrofit opportunities.

– Alberta Energy Efficiency Alliance (online submission)

5.1 Residential Direct Install (DI)

In a Residential Direct Install program, low-cost energy efficiency products are installed in homes at no cost to consumers. Installation is conducted by qualified agents who schedule home visits. Both single-family homes and multi-family dwellings are eligible for the program, as are all income levels. Examples⁷ of direct install products include:

- LED lighting;
- LED night lights;
- Smart power bars;
- Low-flow showerheads and aerators;
- Hot water pipe wrap; and
- Smart thermostats.

A secondary benefit of a Direct Install program is that it opens the door to larger conversations about energy efficiency and the value of more comprehensive assessments and upgrades.

5.2 Consumer Products

Consumer Products offers incentives (point-of-sale, online or mail-in) for purchase of energy efficient appliances and electronics that are independently certified to save energy without sacrificing features or functionality. It is recommended that incentives include appliances only at the top tier of energy efficiency to maximize effectiveness. Examples of eligible consumer products include:

- LED lights, smart power bars and timers, smart thermostats, and low-flow showerheads and aerators;
- Appliances and electronics;
- Insulation and draft-proofing products; and
- Water heaters.

7. These are examples only. Actual products available through the Direct Install program or any other identified program may vary.

A Consumer Products program fits well with a Direct Install program because it includes affordable products like those included in the Direct Install program, but it also includes more expensive purchases.

5.3 Business, Non-Profit, Institutions (BNI) Incentives

Business, Non-Profit, Institutions incentives assist non-residential buildings (including businesses, non-profits, institutions, and co-operatives) to reduce their emissions and energy use. The program offers incentives on products and installation of energy efficiency measures. The initial core offerings would be expanded over time. Examples of products eligible for BNI Incentives include lighting, heating, ventilation, air-conditioning systems and water heating.

Commercial lighting, including interior lighting, exterior lighting and building signage all contribute to significant GHG emissions. Upgrading lighting to LEDs is a proven measure that is cost-effective and can benefit Albertans in all communities.

– Comment from Alberta business (online submission)

5.4 Small Solar Photovoltaic (PV)

It was clear from the public consultations that there is significant interest in solar PV systems. Their visibility often creates discussion and can serve as a useful stimulus for public engagement. In addition to the three programs mentioned above, and subject to some further analysis and modeling, the Panel recommends the launch of a cost-effective and high impact Small Solar PV program to be followed by additional initiatives to support the development of community energy systems in the province.

The Small Solar PV program could provide financial incentives to support the installation of solar photovoltaic systems on buildings, including homes, businesses, and community structures, under the Micro-Generation Regulation. This program will reduce greenhouse gas emissions, generate electricity at the point-of-use, and ensure reliable electricity generation for over 25 years. A financial incentive will lower the cost of installing the solar system and help ensure a net financial savings on electricity. A secondary benefit of a Small Solar PV program is that investment in on-site electricity generation often leads to an increase in energy conservation and energy efficiency measures.

A Small Solar PV program builds on programs already available today. There currently are programs for farms, municipalities, and Indigenous communities (see Appendix F). This new program extends the ability to participate in solar PV to the rest of the province. See also Section 7.

Investments from grassroots Albertans through community-owned solar and micro-generation have the ability to significantly contribute to the electricity grid transformation when we appropriately support its development

– Starland County (online submission)

Timelines and Future Programming

To launch these programs successfully in early 2017, the Panel recommends they be developed immediately and requests for proposals for their delivery be released as soon as possible. Additional programming, as is seen in other jurisdictions and as discussed in Recommendation 1.2, should also be pursued to target specific audiences.

6. FUTURE PROGRAMMING (ENERGY EFFICIENCY)

Economic energy efficiency and conservation opportunities exist in every building and industrial facility – new and old – but are sometimes not seized because of lack of awareness, expertise, motivation, capital or confidence. Programs to address these barriers exist in nearly every jurisdiction in Canada and the United States and they regularly demonstrate that they save consumers more money than they cost. At the same time they create jobs and reduce emissions.

CALGARY PUBLIC BUILDING – HISTORIC AND FUNCTIONAL

Is it possible to preserve the historical integrity of Alberta's original structures and, at the same time, their functionality? The Calgary Public Building, completed in 1931 in the Modern Classical style and renovated in 2010, has been recognized as a prime example of this.

To achieve modern comfort and efficiency (up to LEED Platinum standards, in fact), engineers protected the building from the elements within an energy efficient envelope liner. They renewed the building's original daylighting and natural ventilation and then installed modern systems all kept running at optimal efficiency through digital technology and streamlined operations and maintenance.

The renovation has lowered operating costs in the Calgary Public Building by an impressive 46 per cent, while reducing greenhouse gas emissions by 54 per cent. The installation of low-flow toilets and automatic faucets has reduced water consumption by 45 per cent; solar technology now heats 60 per cent of the building's hot water.

Other jurisdictions commonly use a portfolio of programs to address different barriers, support a wide range of technologies and practices, and target a range of sectors, sub-sectors and consumer types. Refer to an online submission from the UK Energy Savings Trust and case studies from EfficiencyOne and the Energy Trust of Oregon, for examples. In addition to those recommended for initial programming, the Panel also considered the following programs addressing:

- Home heating systems. Heating systems are a significant energy user in homes. Installing a high efficiency heating system can reduce energy bills and improve comfort and health. Programs for home heating system typically involve incentives for buying top tier high efficiency furnaces.
- Whole home assessments and retrofits. There are many ways to increase the energy efficiency of a home. This type of program uses an energy assessment to identify high priority opportunities specific to a given home (e.g., insulation, air sealing, water heaters, drain water heat recovery, solar water heating, windows) and provides incentives to support upgrades.
- Multi-family building assessments and retrofits. This program supports energy assessments and upgrades, but is tailored to the needs of multi-family buildings which have unique ownership and tenancy structures. Measures that can be supported range from direct installation of low-cost energy efficient products to those included in both residential and commercial programs.
- Custom assessments and upgrades for businesses, non-profits and institutions. Beyond the basic incentive program for businesses, non-profits and institutions (BNI) listed under initial programming, this program supports energy assessments for buildings as well as building improvements such as demand control ventilation, envelope improvements, building automation and control systems, energy management systems and custom measures. Note that is expected that BNI programming should be available to all non-residential buildings, small and medium-sized industrial facilities and agricultural operations, including but not limited to businesses, non-profits, institutions, co-operatives and farms.
- New homes and buildings. One of the best times to upgrade the energy features of homes and buildings is during initial construction. This program provides incentives to build to high energy efficiency levels and encourages many of the measures found in retrofit programs, but takes a customized approach for new builds.
- Low-income households. Low-income households are less able to participate in energy efficiency programs than those with higher incomes. While they typically participate in direct install and consumer products programs (with a focus on lower-cost items), a program targeted to those with low incomes helps to increase uptake of additional measures. Eligible measures can include those available in other residential upgrade programs, but offered at greater incentive levels.

- Small businesses, non-profits and institutions. Small businesses, non-profits and institutions have differing abilities when it comes to participation in energy efficiency programs (as compared with large businesses). In some cases, programs are customized for the specific needs of each sub-group. These programs can include direct install of low-cost measures, incentives for large upgrades, no-cost energy assessments, turn-key services for upgrades, and attractive financing arrangements to help make upgrades financially accessible.
- Energy reports for homes and buildings comparing energy use to peers. Reports comparing the energy use of a home or building to its peers has proven to be effective in reducing energy consumption and increasing the uptake of energy efficiency incentive programs. Making these reports widely available to individuals and organizations across the province is an opportunity to not only increase awareness of energy use, but to drive energy savings.

6.1 The Panel recommends the development of additional programming for energy efficiency similar to that of other jurisdictions pending proper assessment for applicability in the Alberta market. The Panel recommends the development of additional programming for energy efficiency similar to those in other jurisdictions pending proper assessment for applicability in the Alberta market. It is also recommended that future programs be advanced as soon as possible to maximize the benefits of these programs for Albertans in the short term.

It is also important to note that as a best practice, programming is often developed with the support of jurisdiction-specific market research. Given the importance of launching programming quickly, initial efficiency programming (Direct Install, Consumer Products, and BNI Incentives) was chosen for its very low risk nature despite the lack of Alberta-specific market research. However, in the longer-term, this information gap must be filled. Refer to an online submission by the Alberta Energy Efficiency Alliance.

To the best of the Panel's knowledge, no detailed research exists that assesses the detailed technical and economically achievable potentials for energy savings in the province. While there are similarities to other North American jurisdictions, Alberta's energy system is unique in many respects. Market research is important to be able to quantify the savings opportunities, and to design the best approaches to capture them. While the initial recommendations are common short-term programs known to have widespread applicability, a thorough technical potential study (along with regular updates), is important to establish long-term goals and the programming required to meet them. Given the importance of obtaining the data, the following recommendation is an important near-term step as Energy Efficiency Alberta begins its work.

6.2 The Panel recommends Alberta-specific market research be undertaken to inform future program selection, design and evaluation. This includes the development of a comprehensive Conservation Potential Review for the province to guide the development of a longer-term energy efficiency and conservation strategy.

7. FUTURE PROGRAMMING (COMMUNITY ENERGY SYSTEMS)

The benefits of community energy systems are many: greater grid diversity, reduced transmission requirements, involvement of local communities, reduced emissions and job creation. See, for example, online submissions from the Pembina Institute and Canadian Wind Energy Association. These systems have a place in Alberta's future energy infrastructure and are a part of the mandate of Energy Efficiency Alberta. They present opportunities for efficiency in many different sizes, applications and technologies.

The Panel's initial program recommendations focus on Small Solar PV installed to reduce or offset electricity consumption from homes, businesses and other buildings.

To drive further adoption of community energy systems, the Government of Alberta needs to outline a vision for what role these systems will play in meeting the energy needs of Alberta. Without proper policy direction, it will be difficult for Energy Efficiency Alberta to develop and implement meaningful programs that support community energy. As such, in addition to a Small Solar PV program:

7.1 The Panel recommends at the earliest time possible, the Government of Alberta identify its targets for the scale of community-owned energy systems together with financial mechanisms consistent with achieving these targets, for example, incentives to promote their adoption through the Alberta Electric System Operator or another agency. See also Recommendation 12.1 and 12.2.

Failure to act on this recommendation will delay or limit the development of community-owned energy systems in the province. Groups expressing interest in the development of these systems – co-operatives, Indigenous communities and others – need clarity and support to do so.

In addition to the recommendations above there are two distinct categories of community energy systems that offer unique benefits and have distinct challenges: the Agency could play a role to support community-owned renewable energy systems and non-utility scale community energy systems.

Community-Owned Renewable Energy Systems

As the name suggests, community-owned renewable energy systems are systems that generate electricity from renewable sources through systems that have a joint ownership across a collection of individuals. These systems can take on many forms, including rooftop solar, distribution-connected solar farms, distribution-connected wind energy systems, and run-of-the-river hydro-electricity systems. Community-owned systems are typically larger than individually owned systems and do not necessarily aim to offset the on-site electricity needs of a particular building, but rather they aim to provide a benefit to the participants through a revenue and profit-sharing arrangement.

They can offer a lower cost approach to renewable energy generation relative to individual systems due to economies of scale, and they can enable much broader participation from Albertans who may not have a home suitable for individual systems (e.g., condos, apartments, shaded rooftops) or may wish to invest in only a small share.

The most significant barriers to implementation identified were lack of funding to reduce the overall cost of investments, limited access to financing mechanisms to spread the up-front costs over the life of the investment, and the need for regulations that support these types of systems.

With the currently allocated budget, Energy Efficiency Alberta is not well-suited to provide effective capital and revenue incentives to support a significant amount of community-owned renewable energy systems over the long-term. However, until a long-term approach is implemented in Alberta, the Agency could play a role to support a collection of projects that pioneer this concept, perhaps through partnerships with elements of the provincial and national innovation systems to demonstrate what may be possible (see also Section 13).

7.2 The Panel recommends Energy Efficiency Alberta develop a program to provide financial support for initial community-owned renewable energy systems and ongoing technical support over the long term.

This program would focus on projects that are not applicable to the Small Solar PV program (see Section 5.4) and could include community wind and other renewable energy installations combined with complementary technologies, for example, storage and smart grid applications in demonstration projects.

7.3 The Panel also recommends the Government of Alberta work with Energy Efficiency Alberta and all other relevant organizations to determine how best to support community-owned renewable energy systems over the long term, consistent with Recommendation 7.1.

Existing legislation does allow community-owned renewable energy systems. However, due to the ownership model and large range in the size and types of systems in this category, many community-owned systems currently face a relatively complex approval and grid connection process.

7.4 While the development of regulatory enabling mechanisms is beyond the scope of Energy Efficiency Alberta, the Panel recommends the Government of Alberta continue efforts to enable community-owned renewable energy system either through updates to the existing Micro-Generation Regulation or through new regulations.

INDIGENOUS COMMUNITIES: A LOOK AT EXISTING PROGRAMS

The Alberta Indigenous Solar Program provides grants of up to \$200,000 per project to First Nations, Métis Settlements and Indigenous organizations. The money is used to install solar panels on buildings owned by communities or organizations, such as offices, medical centres, schools and more.

The Alberta Indigenous Community Energy Program helps First Nations and Métis Settlements reduce emissions and save on energy costs through community energy audits funded to a maximum of \$90,000.

Together, the two pilot programs will provide \$2.5 million for First Nations and Métis Settlements to undertake renewable energy projects and energy efficiency audits in their communities.

Non-Utility Scale Community Energy Systems

For other technologies and applications that meet the definition of community energy systems, Energy Efficiency Alberta should work with proponents to identify opportunities for their advancement that are within the abilities of the Agency. This may include working to identify and overcome barriers to further adoption in the province and incorporating opportunities into Agency programming where appropriate.

7.5 The Panel recommends Energy Efficiency Alberta develop an approach for supporting the advancement of a broad range of community energy systems that are able to contribute to the province's climate change objectives.

8. TRANSPORTATION

Opportunities to reduce costs, and or greenhouse gas emissions associated with transportation include: changes to driving habits, vehicle maintenance, carpooling, combining or avoiding trips, improved vehicle efficiencies (including efficiency add-ons for freight vehicles), vehicle scrappage programs, alternative fuel vehicles (e.g., electricity natural gas, biofuels), and using transit and active transportation.

While transportation was not selected for initial incentive programs, the Panel recognized that it is important to raise awareness around no/low-cost actions to save fuel. Therefore:

8.1 The Panel recommends early outreach messaging by Energy Efficiency Alberta include information on no and low-cost ways to save fuel. This includes consideration of driver training outreach for fleets in the municipal, education and non-profit sectors.

In the medium-term, it is recognized that while Energy Efficiency Alberta has a role to play in supporting transportation initiatives, there are many other influences in this area that need to be considered. For example, municipalities play a significant role when it comes to personal transportation. The province's green infrastructure funding, also funded through the carbon levy, will play a significant role in the development of transportation infrastructure.

8.2 The Panel recommends Energy Efficiency Alberta develop a strategy for future programming related to transportation and how it will align with the efforts of other initiatives.

Based on research into transportation programming in other jurisdictions, investigation of future programming for Alberta could include:

- Support for passenger car alternatives like car-pooling, public transportation and active transportation.
- Vehicle scrappage programs.
- Incentives (such as rebates) for alternate fuel vehicles, and fueling or charging stations.
- Freight specific opportunities such as driver training and feedback, aerodynamic devices and anti-idling technologies.

Investments in public transit to improve public transportation services within and between communities will reduce GHG emissions and create more livable communities.

– Alberta Urban Municipalities Association (online submission)

9. INDIGENOUS COMMUNITIES

The Panel sought input from Indigenous communities on what programs and services would benefit them, given their unique circumstances related to jurisdictional complexity, geography, economic situation, and reliance on the environment – all of which affect their ability to equitably access services and funding. While much useful input was provided, some Indigenous community attendees at formal meetings expressed concerns about the engagement process itself. The Panel will share with Energy Efficiency Alberta suggestions for improving future engagements, including the need to involve Indigenous communities more directly in their setup. In addition to formal outreach events, Panel member Desmond Bull conducted successful personal outreach on behalf of the Panel (see Appendix D).

Indigenous communities told the Panel that housing and infrastructure are two of their biggest concerns. They said it is difficult to retrofit homes to be more energy efficient when current housing is either inadequate or unavailable. A further complication is that there are no uniform building standards that apply to First Nations communities and Métis Settlements.

9.1 The Panel recommends the province works in collaboration with Indigenous Communities and the federal government to define best practices in applicable codes and standards for First Nations and Métis settlement housing, including those related to the Alberta Building Code and the National Energy Code.

The Panel heard Indigenous Communities want to participate in community scale projects, but often do not have the capacity to do so.

9.2 The Panel recommends the provincial Department of Indigenous Relations and Energy Efficiency Alberta work with communities to ensure the provision of independent technical and financial capacity at the community level to undertake energy efficiency measures and develop community energy systems, thereby instilling a pride of ownership in these initiatives and contributing to employment and economic development and diversification.

The Panel recognizes there are a number of funding programs at the federal, provincial and local levels that Indigenous communities could access to advance energy efficiency in their homes and communities. As we heard in our outreach sessions, Energy Efficiency Alberta will also need to assure itself that individual members of Indigenous communities feel they have fair access to relevant programming and qualified contractors.

To increase awareness and make program application processes simple and efficient:

9.3 The Panel recommends the provincial Department of Indigenous Relations work with Energy Efficiency Alberta to ensure intergovernmental and interagency collaboration so that Indigenous communities can efficiently and equitably access and leverage all available energy efficiency and renewable energy related complementary funding, including funding related to housing, land use and infrastructure planning.

To ensure ongoing dialogue with Indigenous communities:

9.4 The Panel recommends Energy Efficiency Alberta establish a formal Indigenous advisory mechanism with representation from the Departments of Education and Economic Development and Trade, as well as relevant technical fields. Representation from Indigenous and Northern Affairs Canada would also be important to the success of the advisory mechanism.

Additionally, Indigenous communities said they would value programing, outreach and education specifically directed to them, including:

- Local capacity development and training that supports economic development and diversification.
- The development of community-based energy systems that support energy security and resilience and that provide opportunities for economic development and diversification.

- Education opportunities that expand on formal education. These would respect the cultural sharing of stories using a variety of methodologies, including in-person community-level education. It was noted that the Agency could facilitate the exchange of information nation-to-nation, including success stories and examples related to energy efficiency and community energy systems.
- Programming that encompasses the whole community, focuses on housing, and addresses the specific issues and needs of each community.

The Alberta Departments of Labour, Human Services and Advanced Education have all conducted work with a view to creating an approach to ‘lifelong learning’ for adults in Alberta, from foundational learning to post-secondary education. There may be some value in including representatives from these departments to support climate-related and energy-related education within Indigenous communities. It is equally important to leverage the work of Indigenous community institutions, for example those that provide training programs through Employment and Social Development Canada in the Aboriginal Skills and Employment Training Strategy or through the First Nations colleges of which there are five. See online submission from TREC Education for examples of education and awareness initiatives related to sustainable energy in First Nations communities in Ontario.

10.ACCESS TO DATA

The Panel heard several times that access to energy-use data and the use of benchmarking is an important part of designing and delivering effective programs. See, for example, online submissions from the Canada Green Building Council, Quest, and North American Insulation Manufacturers Association Canada. For example, user-specific energy consumption data are commonly used to individualize outreach efforts and increase program participation. It is also important for accurately measuring the impact of programs. This can all be accomplished while maintaining appropriate privacy protection.

10.1 The Panel recommends the Government of Alberta develop mechanisms, including the development of a regulation, to enable Energy Efficiency Alberta to employ user-specific energy consumption data to enhance program design and delivery while maintaining appropriate privacy controls.

10.2 The Panel recommends Alberta Energy also incorporate the issue of access to data within their regulatory review process.



LOUIS BULL TRIBE SUPPORTS GREEN ENERGY

Two-and-a-half years of concentrated effort has resulted in four public buildings on the Louis Bull reserve having solar energy. But more than that, it has shown that First Nations can take a leadership role in green energy development.

Solar power is a common means by which many First Nations communities are embracing green energy, said Louis Bull Tribe Councilor Desmond Bull.⁸ Solar power is easier to maintain and easier to install. Training can be done within a few months.

“Once you’ve learned how to do installations on your own, once you’ve learned the effectiveness of hardware, then you’re able to go out and develop your own private partnership or expand on the work your tribe or Nation is doing,” said Bull.

In moving forward with renewable energy development, Councilor Bull would like to see First Nations form a co-operative. By working together, he says, they can pool their expertise, develop trustworthy sources for advice and inspections, and buy hardware and equipment in bulk therefore reducing the costs.

- *Excerpt from AAMSA article by Shari Narine Sweetgrass, Contributing Editor, Sept. 27, 2016*

8. Desmond Bull is a member of the Energy Efficiency Advisory Panel. Desmond has successfully led and fundraised to advance solar energy projects for his Nation.

11. FINANCING

Financing, along with information, incentives and regulations, is one of the primary tools to advancing energy efficiency and community energy systems. See, for example, online submissions by the Canadian Coalition for Green Finance⁹ and the RMI case study. Financial tools can play a very key role in opening access for a much broader range of people and businesses to participate in energy efficiency and community energy programming. Examples of financing models include equity financing, property-tied financing, on bill financing, low-interest loans, leases, green banks and other financing tools that specialize in energy efficiency and community energy systems.

11.1 The Panel recommends Energy Efficiency Alberta investigate opportunities for innovative financing for energy efficiency and community energy systems; and support them where appropriate. This includes, but is not limited, to the following opportunities:

- Property-tied financing known as Property Assessed Clean Energy or PACE, which has been successful in the United States and is emerging in Canada. The Panel recommends the government examine the option of empowering municipalities to enable property-tied financing for energy efficiency and on-site energy systems. See also online submission from Property Assessed Clean Energy.
- The Capital Borrowing Regulation for schools in Alberta, which allows them to finance energy efficiency upgrades at a low interest rate as long as the energy savings are guaranteed by a third party. It is suggested that the Government of Alberta consider expanding this mechanism to other institutions. A complementary action would be for the government to formally authorize the use of energy service performance contracts (which include energy-saving guarantees) for public sector buildings which is common practice in the United States.
- A Community Economic and Development Investment Fund (CEDIF) is a tax-efficient investment vehicle for individual community members to establish a pool of capital to invest in for-profit entities within a defined community. These funds are controlled by a local group of officers and directors, who may be chosen by the founders and promoters of the CEDIF or by the CEDIF's investors at an annual general meeting. These funds have been used successfully in Nova Scotia to establish significant quantities of community renewable energy in that province.

9. These included a significant report from the International Renewable Energy Agency on *Unlocking Renewable Energy Investment: The Role of Risk Mitigation and Structured Finance*.

- Opportunity Development Co-operatives which pool capital through the sale of shares eligible for Registered Retirement Savings Plans and Tax Free Savings Accounts. They allow for the local control of private capital to be directed towards economic development. This has created vibrant local economies through new jobs and an increase in local business activity. There are currently seven Opportunity Development Co-operatives across the province that have invested close to \$2 million into their local economies, created numerous jobs, and charted new courses for economic development in parts of the province that were dwindling. A notable example is the Sangudo Opportunity Development Co-operative, which recently completed its fifth capital investment. Most recently, the structure has been used to create the Alberta Solar Co-operative, which is seeking to create the first co-operatively owned distributed generation solar farm.

The Panel recognizes there is no one single tool that can fill the financing needs for Energy Efficiency Alberta and associated programming. Rather, the Agency must determine which financing tool works best for each situation and identify opportunities to work with others on their advancement.

12. INTEGRATION WITH THE UTILITY SYSTEM

A nearly universal approach to energy efficiency and community energy systems in other jurisdictions is to consider them holistically within the oversight of the utility system. This is done, in large part, by including demand-side management within the mandate of regulators and electric system operators. This enables those entities to give full consideration to energy efficiency and community energy system benefits and opportunities, and make available tools used in other jurisdictions to support their uptake in a way that is in the interests of consumers.

For example, regulators routinely identify that net savings for consumers can be generated by investing a portion of utility revenues into demand-side management and deferring the construction of supply-side resources (including the expansion of transmission lines). Taking a similar approach to demand-side management in Alberta has the potential to increase the role of energy efficiency and community energy systems in the province while creating cost savings, employment and greenhouse gas reductions.

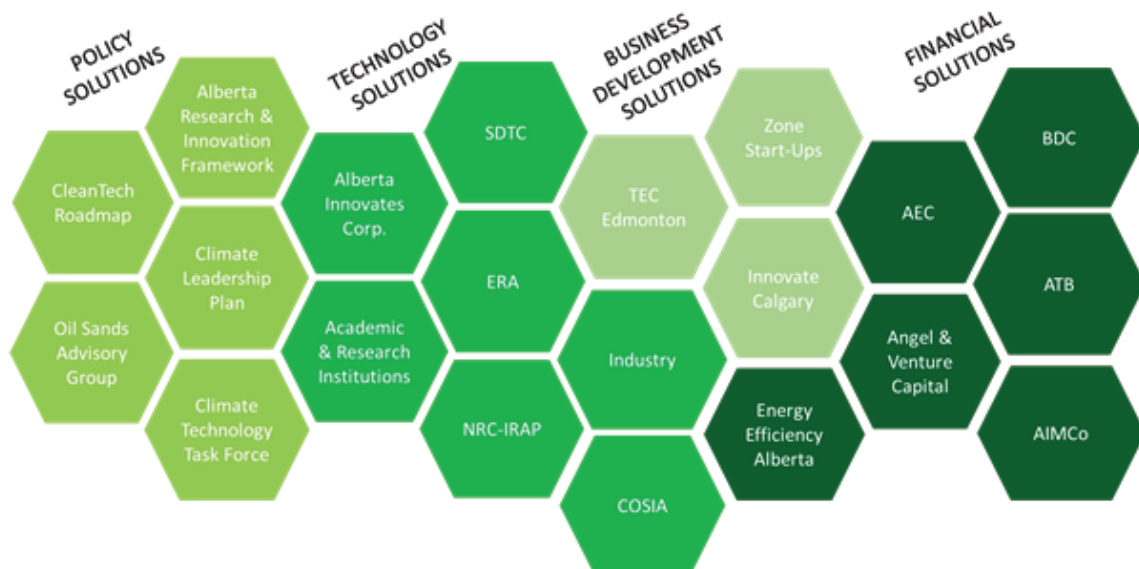
12.1 The Panel recommends Alberta Energy consider creating an energy efficiency and community energy system mandate for its utility regulator and electric system operator.

12.2 The Panel recommends Service Alberta should consider adding an energy efficiency and community energy system mandate for the Utilities Consumer Advocate.

13. LINKS TO INNOVATION, RESEARCH AND DEVELOPMENT, AND COMMERCIALIZATION

Many mechanisms for the promotion of innovation, research and development, and commercialization of clean energy technologies are emerging in Alberta and Canada. These mechanisms may be expected to significantly enhance the growth of 'clean tech' elements of the private sector within the provincial economy and further enhance the impact of investments by Energy Efficiency Alberta.

Below we reproduce a map - courtesy of Stephen MacDonald of Emissions Reduction Alberta - of the emerging provincial and national innovation landscape for clean technology and clean energy related research and development that may lead to commercially viable technologies and business models in Alberta. While not necessarily fully capturing all the parts of the system, it does clearly show that the ecosystem is complex and involves a number of interrelated processes and structures.



Given the transformation that is about to occur throughout the Alberta economy and energy system, and this rich array of complementary innovation actors and programs, it is important for strong links to be created between the market ‘pull’ of Energy Efficiency Alberta programming and the capacity of the private sector and post-secondary institutions to develop novel products and services to satisfy the new demands. In this way, Alberta may achieve competitive economic advantage through the research, development and commercialization of products and services that emerge. Such commercialization should generate significant private sector employment and export opportunities for the province.

Important entities in our context include:

- The Climate Technology Task Force, formed September 2016, “to provide recommendations on targeting investments in climate technology to help transition to a lower-carbon economy.” Chaired by Gord Lambert, the task force will provide advice to the provincial government on how to achieve competitive advantage as a result of the many investments now being made in climate science and technology both by industry and by provincial and federal governments.
- Emissions Reduction Alberta, formerly the Climate Change and Emissions Management Corporation (CCEMC), has a mandate to “identify and accelerate innovative solutions that secure Alberta’s success in a lower carbon economy.” See also CCEMC case study in appendix E.
- The Alberta Innovates Corporation. It oversees the Energy and Environment Solutions program and aspires to be “the lead agency for advancing energy and environmental technology innovation in Alberta.”
- The federal government itself, which recently granted \$150 million under the Canada First Research Excellence Fund to two climate-related research institutes at the University of Alberta and the University of Calgary (see Appendix G for a description of these and other post-secondary activities relevant to the work of Energy Efficiency Alberta).
- Alberta Economic Development and Trade. The department has already commissioned a Cleantech Sector Roadmap to examine opportunities in energy efficiency, power generation and material efficiency. While the Cleantech Sector Roadmap is still in draft form, it identifies wind, digital oilfield technology and green buildings as promising opportunities for the short term. The Roadmap highlights synergies between the Climate Leadership Plan ‘innovation system’ enhancements and the Economic Growth and Diversification Plan with potential economic benefits for Alberta including job creation and diversification of the economy.

13.1 The Panel recommends Energy Efficiency Alberta be formally represented within the new innovation structures and initiatives being developed by the Government of Alberta under the mandate of the Climate Technology Task Force through explicit governance and operational links.

13.2 The Panel recommends Energy Efficiency Alberta support the recommendations of the Climate Technology Task Force when they emerge and that ‘contribution to innovation’ be used as a potential criterion for certain programming of the Agency (e.g., where community level and other demonstration projects are deemed to meet the normal criteria for programming and where long-term economic benefits may accrue).

COMPLEMENTARY POLICIES AND INITIATIVES

There are complementary policies and initiatives Energy Efficiency Alberta should be aware of once it starts its operations. All have a bearing on the programs and success of the Agency. The most important are noted here.

LARGE INDUSTRY

While large industry is not within the mandate of the Panel, the Panel would like to acknowledge the numerous government initiatives designed to reduce greenhouse gas emissions by large industry. Studies show there is also untapped potential for energy efficiency within large industry. The Panel expects the government will continue to explore opportunities to encourage energy efficiency upgrades within industry (beyond those already in place or under development), and that industry will make progress in implementing energy efficiency measures as part of a broader Alberta-wide commitment to securing a more energy efficient province.

MICRO-GENERATION REGULATION

Alberta Energy is currently reviewing its Micro-Generation Regulation to determine whether changes are required. The Regulation enables small-scale generation of electric power by individuals, small businesses and communities to meet their own needs, as an alternative or supplement to traditional centralized grid-connected power. The current Micro-Generation Regulation expires on December 31, 2016.

BUILDING CODES

Building codes ensure a minimum level of energy efficiency for new construction, whereas information and incentive programs typically increase construction practices beyond common practice. However, an integrated approach of energy efficiency programs, collaboration with industry, and timely adoption of new building codes can support consistent energy efficient construction across Canada. It is recognized that the Alberta Building Code is an important complementary policy to increasing energy efficiency.

FIXED VERSUS VARIABLE UTILITY CHARGES

During consultations, many stakeholders suggested authorities investigate the potential for greater adoption of energy efficiency and community energy systems by reducing the ratio of fixed versus variable charges on utility bills. Increasing the amount of variable charges associated with electricity transmission costs, for example, can help reduce electricity consumption and the demand for transmission infrastructure thus creating system-wide cost savings. It is recognized, however, that the cost of utility infrastructure must be spread among the consumers that are benefiting from it and without overly burdening vulnerable Albertans. The continued evolution of this conversation will be important for both consumers and Energy Efficiency Alberta as the structure of utility charges has significant bearing on how the utility system is used and its associated economic impacts.

BUILDING ENERGY PERFORMANCE AND DISCLOSURE

Benchmarking and disclosing a building's energy use is a tool increasingly used to support attention and action for energy efficiency. The Climate Change Advisory Panel recommended the government enable municipalities to advance energy-performance reporting and disclosure for buildings and homes within their communities if they so choose.

ALIGNMENT WITH OTHER GOVERNMENT PROGRAMS

The Agency must identify and align with other government programs delivering energy efficiency, and or community energy system programs. This will be essential to avoid unnecessary duplication, inefficiency or working at cross purposes.

SOLAR FARM

Half of the provincial government's electricity needs may soon be powered by solar energy.

To encourage growth in green technologies and further diversify Alberta's power grid, the government is asking solar companies to provide advice on how they would approach a large-scale project to supply power to government. This initiative would result in many "firsts" for Alberta: Canada's first 50 per cent solar-powered government, Western Canada's first large-scale solar farm to provide the electricity and Alberta's first utility-scale jobs. This initiative illustrates how the Government of Alberta can lead by example.



GETTING IT RIGHT: A MORE ENERGY EFFICIENT ALBERTA

List of Appendices

Appendix A: Definitions

Appendix B: Panel Biographies

Appendix C: Energy Efficiency and Small-Scale/Community Energy Technologies and Practices

- Examples of Energy Efficient Technologies and Practices for different sectors of the economy. These examples were provided to participants at engagements held by the Advisory Panel.

Appendix D: List of Engagements

- Details of the Public Open Houses, Technical and Indigenous Sessions attended by the Advisory Panel.

Appendix E: Case Studies

- Summaries of presentations made to the Advisory Panel by other organizations engaged in energy efficiency and community energy programs.

Appendix F: Provincial Energy Efficiency Programs

- Listing of energy efficiency programs currently in Alberta.

Appendix G: Climate-related Research at Alberta Universities, Institutes and Colleges

- A brief description of research currently underway in Alberta in post-secondary institutions.

Appendix H: Supporting Research

- Reports commissioned by the Advisory Panel in the course of its work.
 - a) Energy Efficiency Program Design Options (Dunsky Energy Consulting)
 - b) A Review of Policy Rationales for Independent Energy Efficiency Administration (Brendan Haley)
 - c) Oversight and KPI's (Dunsky Energy Consulting)
 - d) Benchmarking (Dunsky Energy Consulting)
 - e) Delivery Models (Dunsky Energy Consulting)
 - f) Assisting Communities to Transition Toward and Take Action on Energy Efficiency (Efficiency One – Nova Scotia)

Appendix I: List of Submissions to the Panel

- An abbreviated listing of submissions to the Advisory Panel through the Panel website. The link to the actual submissions can be found at <http://www.alberta.ca/energy-efficiency-get-involved.aspx>.

Appendix J: Panel Code of Conduct

- The documents outlining the roles and responsibilities of the Advisory Panel as it conducted its research.

Appendix A: Definitions

Business, Non-profit and Institution (BNI) includes non-residential buildings, small- and medium-sized industrial facilities, agriculture facilities, etc. used by businesses, non-profits, institutions, co-operatives and others.

Carbon Levy will be included in the price of all fuels that emit greenhouse gases when combusted. These include transportation and heating fuels such as diesel, gasoline, natural gas and propane. It will not apply directly to consumer purchases of electricity. The carbon levy will be introduced January 1, 2017 and will reflect a price of \$20 per tonne of carbon dioxide equivalent emissions, rising to \$30 per tonne on January 1, 2018.

Carbon rebate is a partial refund that will offset costs associated with the carbon levy to help low-and middle-income households adjust.

Community is a self-organized network of people with a common agenda, cause, or interest, who collaborate by sharing ideas, information and other resources. They are not restricted by size.

Community energy systems can be defined in a variety of ways. The Panel recommends Energy Efficiency Alberta consider including the following definitions of community energy systems within its scope of operations:

- Renewable and low-emissions alternative electricity generation technologies less than 5 MW.
- Community-owned electricity generating systems (of any size) involving majority ownership by Indigenous communities, municipalities, institutions (including schools), co-operatives and other non-profits.
- Heating and/or cooling technologies considered renewable or alternative energy.

Community-owned Renewable Energy refers to energy projects that are generally locally owned and operated, and designed to provide local economic and social benefits. Community members typically control the definition, management and execution of the project so that the goals of the project align with the goals of the local community.

Co-operatives are an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise.

Energy Efficiency Advisory Panel refers to the Panel established by the Government of Alberta to engage with Albertans and make programming recommendations to Energy Efficiency Alberta. The Energy Efficiency Advisory Panel is the author of this report.

Energy Efficiency Alberta is the Agency established by the Government of Alberta to deliver energy efficiency and community energy systems in Alberta.

Energy efficiency means using less energy to provide the same service, often using new technologies or more efficient products – for example, LED lighting versus a traditional incandescent bulb.

Energy conservation is simply using less energy. Turning off a light when you leave the room is an example of energy conservation.

Incentive is a financial tool to encourage purchasing.

Microgeneration is as defined by the *Micro-Generation Regulation*, under the *Electric Utilities Act*.

Retrofit means adding a component or accessory to something like a building, that did not have it when originally built. It includes upgrades on existing infrastructure.

Appendix B: Panel Biographies¹

DR. DAVID WHEELER, CHAIR

President and Vice Chancellor, Cape Breton University

Dr. Wheeler is an internationally known academic and business leader having held senior positions in academic institutions in the UK and Canada, and consulted with a number of United Nations institutions and the World Bank on questions of sustainable development. In recent years Dr. Wheeler has focused much of his advisory work in the fields of energy conservation and renewable energy policy in Canada and the UK. He established multi-stakeholder consensus on energy efficiency and renewable electricity policy reform for the province of Nova Scotia. He is a member the Environmental and Social Advisory Council for the European Bank for Reconstruction and Development and the Corporate Social Responsibility Advisory Council for Export Development Canada.

MICHELE AASGARD

Alberta Community and Co-Operative Association (ACCA)

Ms. Aasgard is the Executive Director of the Alberta Community and Co-operative Association. Michele is a management professional with over 25 years of extensive experience in communications, relationship building, business administration, training and development. The ACCA provides management, outreach and coordination of numerous co-ops across Alberta and works to strengthen Alberta communities by providing leadership development and fostering co-operative values.

DESMOND BULL

Councillor for the Louis Bull Tribe of the Maskwacis Nation

Mr. Bull has been committed to the field of education since 2001. He began as an educational assistant for the Ermineskin Tribe, followed by working for Louis Bull Education. He completed the Aboriginal leadership, governance and management program with The Banff Centre and was elected in 2013 to Council for the Louis Bull Tribe. Desmond views renewable energy as important for employment and development opportunities, and for youth involvement in their Nation. Desmond has successfully led and fundraised to advance solar energy projects for his Nation.

TANYA DORAN

Stantec

Ms. Doran is the Senior Sustainability Lead - Alberta for Stantec. She supports green buildings in the province, is an advocate for green building certification and resiliency for the built environment. Her past experience includes serving as the Executive Director for the Alberta Chapter – Canada Green Building Council and is a current member of the Environmental Advisory Committee for the City of St. Albert.

¹ Professional affiliations are provided for means of identification only and do not imply the endorsement of the Panel's report by bodies employing Panel Members. Panel members also signed a Code of Conduct (Appendix J) governing processes for avoiding conflicts of interest.

MARC HUOT

Municipal Climate Change Action Centre

Mr. Huot is a professional engineer and the Manager of the Municipal Climate Change Action Centre (MCCAC). As a part of the MCCAC team, Marc helps municipalities across Alberta reduce their greenhouse gas emissions by providing educational resources, building energy benchmarking, and funding through the MCCAC's energy efficiency and solar energy programs. Prior to joining the MCCAC, Marc worked on topics of energy efficiency and climate change from within the Government of Alberta and as technical and policy analyst with the Pembina Institute. Marc is also a part of the City of Edmonton's Energy Transition Advisory Team. Marc holds Master of Science and Bachelor of Science degrees in Mechanical Engineering from the University of Alberta.

RONI-SUE MORAN

Industry Relations Corporation

Ms. Moran started her career and worked 15 years for the Government of Canada, primarily as the Chief of Corporate Services responsible for Finance, Human Resources, Facility Management and Occupational Health and Safety. Recently she worked for Christina River Enterprises as the General Manager and stepped into the role of CEO when occasions required. In 2015 she was offered the position of Director of Industry Relations Corporation and a Director on the Governance Board for Christina River Enterprises. She is using her experience with federal regulations with policy development to further Fort McMurray #468 First Nation to affect change and inclusiveness for First Nation people.

JESSE ROW

Alberta Energy Efficiency Alliance (AEEA)

Mr. Row is a professional engineer and the Founder and Executive Director of the Alberta Energy Efficiency Alliance. The Alliance is a diverse group of stakeholders actively working to maximize energy efficiency in the province. Its goal is to reduce the barriers to the adoption of energy efficiency technology and activities, recognizing there is a need for all orders of government, businesses, non-profit organizations and individuals to actualize the benefits of energy efficiency.

Appendix C: Energy Efficiency and Small-Scale and Community Energy Technologies and Practices

Examples of Energy Efficient Technologies and Practices		
	Category	Technologies and Behaviours
Residential Buildings	Low cost conservation measures	Programmable thermostats, weather stripping, low-flow showerheads, energy audits
	Appliances	High efficiency appliances (e.g., fridges, washing machines)
	Space and water heating	Insulation, high efficiency furnace and hot water heaters, waste heat recovery systems
	Lighting	Light emitting diodes (LED)
	Building operations	Day-to-day management and operations to improve efficiency
	Behavioural change	Individuals take responsibility for reducing energy use
Commercial Buildings	Auxiliary Motors	High efficiency motors
	Space and water heating	High efficiency furnaces and boilers, furnace vent dampers, and waste heat recovery
	Lighting	Fluorescent upgrades (e.g., t5), bulb, light emitting diodes (LED)
	Auxiliary equipment	High efficiency equipment
	Building operations	Day-to-day management and operations to improve efficiency
	Behavioural change	Individuals take responsibility for reducing energy use
Transportation	High efficiency passenger and commercial vehicles	High efficiency gasoline, high efficiency diesel, hybrid electric and electric vehicles
	Commercial vehicle upgrades	Devices to increase efficiency of commercial vehicles (e.g., anti-idling devices, aerodynamic aids, etc.)
	Conservation and efficient driving techniques	Ride sharing, public transit, fuel consumption labeling, driving consistent speeds, slow acceleration, etc.

Examples of Small-scale and Community Energy Technologies and Practices

Technology	Application Examples	Considerations
Solar Photovoltaic (Solar PV) - Producing electricity using solar energy	<ul style="list-style-type: none"> • Residential • Commercial • MUSH sector (Municipal, Universities, Schools and Hospitals) • Industrial • Community 	<ul style="list-style-type: none"> • Capital costs decrease as technology improves • Alberta has good solar PV potential • Requires space and access to sunlight
Solar Thermal – Producing hot water using solar energy	<ul style="list-style-type: none"> • Residential • Commercial • MUSH sector • Industrial 	<ul style="list-style-type: none"> • Mature technology • Alberta has good solar thermal potential • Requires space and access to sunlight
Small Wind Turbines	<ul style="list-style-type: none"> • Residential • Commercial • MUSH sector 	<ul style="list-style-type: none"> • Not as common as solar technologies • Wind potential varies throughout Alberta
Geothermal – using earth's heat to produce electricity and/or heat	<ul style="list-style-type: none"> • Residential • Commercial • MUSH sector • Industrial • Community 	<ul style="list-style-type: none"> • Potential varies throughout province • Installation is more involved than other technologies • Can include benefit of electricity and heat provisions
Combined Heat and Power systems	<ul style="list-style-type: none"> • Commercial • MUSH sector • Industrial • Community 	<ul style="list-style-type: none"> • Improved efficiency with combined generation • Scalable and suitable for aggregate and larger systems

Appendix D: List of Engagements

PUBLIC OPEN HOUSES

Date	Location
July 18, 2016	Calgary
July 20, 2016	Edmonton
July 27, 2016	Lethbridge
August 9, 2016	Grande Prairie
September 12, 2016	Medicine Hat
October 14, 2016	Maskwacis

TECHNICAL SESSIONS

Date	Session Name	Location
July 12, 2016	Buildings	Edmonton
July 14, 2016	Program Design and Delivery Session	Edmonton
August 23, 2016	Community Energy Systems	Edmonton
September 14 & 15, 2016	Municipal	Edmonton
September 16, 2016	School Boards High School Students/Teachers/Educators	Edmonton

INDIGENOUS COMMUNITY SESSIONS:

Date	Session Name	Location
October 11, 2016	Indigenous Community Session	Calgary
October 12, 2016	Indigenous Community Session	Grande Prairie
October 13, 2016	Indigenous Community Session	Lac La Biche
October 15, 2016	Indigenous Community Session	Edmonton
October 18, 2016	Indigenous Community Session	Fort McMurray

Appendix E: Case Studies

Alberta Agriculture and Forestry shared information on the joint provincial/federal incentive program called Growing Forward 2. This program supports energy management on the farm through incentives, audits and support for solar PV systems. Alberta Agriculture and Forestry emphasized the importance of building relationships, and conducting education and outreach to be successful.

Climate Change and Emission Management Corporation (CCEMC) provides funding for programs and technologies to reduce greenhouse gas emissions in Alberta. Funding has been allocated for programs supporting residential solar systems and combined heat and power in commercial buildings. The CCEMC noted projects can deliver multiple outcomes, in addition to reducing emissions, and information sharing is critical for the advancement of new technologies.

EfficiencyOne is a not-for-profit corporation headquartered in Dartmouth Nova Scotia, and a leader in design and delivery of resource efficiency programs and services for households, businesses, and industrial clients. Efficiency One noted that investments in both energy efficiency and renewables are required to meet climate commitments, but by adopting an “efficiency first” approach, investments in renewable energy go further. This is because energy efficiency helps improve the overall cost-effectiveness of the electricity system, which means lower energy costs and rates, and a faster path toward decarbonizing the electricity sector. EfficiencyOne also said consumers are more likely to embrace and adopt energy efficient behaviours if they understand the value of energy efficiency and how it benefits them personally, their communities and the broader economy.

Energy Trust of Oregon is an independent non-profit organization dedicated to providing low-cost clean energy solutions. The Agency invests in cost-effective energy efficiency, helps to pay the above-market costs of renewable energy, delivers services at a low administrative and program costs, and maintains high levels of customer satisfaction. Energy Trust of Oregon notes that cultivating valuable partnerships with contractors, engineers, architects, realtors and other professionals is important and it grows local businesses.

Rocky Mountain Institute (RMI) is a global energy “think and do” tank. It helps businesses, communities and institutions shift to energy efficiency and renewables. RMI shared its thinking on financing options related to sustainable energy initiatives.

All One Sky presented on energy poverty, and how and why it needs to be addressed. It noted the biggest contributing factors to energy poverty are income, housing quality, and energy price. It emphasized the need to create conditions for affordable energy for low-income households.

Appendix F: Current Energy Efficiency Programs in Alberta

Program	Description	Start/end date
Municipal Climate Change Action Centre – TAME+	TAME+ is a flexible energy efficiency program that provides financial rebates to municipalities who implement energy efficiency retrofits in municipal buildings. TAME+ is designed to support a broad range of measures customized to individual buildings.	2015 - 2018
Municipal Climate Change Action Centre – Alberta Municipal Solar Program	The Alberta Municipal Solar Program provides rebates for the installation of municipally owned solar photovoltaic systems.	2015 - 2018
Growing Forward 2: On-Farm Energy Management Program	This program shares the cost of investments that improve energy efficiency on Alberta farms. It is part of a larger Federal-Provincial-Territorial funding initiative for the Canadian agriculture sector.	2008 - ongoing
Growing Forward 2: Irrigation Efficiency Program	This program helps producers invest in new or upgraded low-pressure centre pivot (LPCP) irrigation equipment for their operations, improving the efficiency of energy and water use on Alberta farms.	2013 - ongoing
Growing Forward 2: On-Farm Solar Management	This program shares the cost of solar panel systems for Alberta farms.	2016 - ongoing
Alberta Emission Offset System	<p>Quantification Protocol for Energy Efficiency Projects:</p> <ul style="list-style-type: none"> Emission offsets are generated from implementing process changes and facility retrofits that result in efficiencies in energy use per unit of productivity. Emission offsets can be generated from industrial commercial and agricultural processes. <p>Quantification Protocol for Energy Efficiency in Commercial and Institutional Buildings:</p> <ul style="list-style-type: none"> Emission offsets are generated from implementing energy efficiency measures in commercial and institutional buildings. 	<p>2007 - ongoing</p> <p>Revisions to protocols expected in 2017 to align with Alberta Climate Leadership Plan.</p>
Climate Change and Emissions Management Corporation (CCEMC)	The CCEMC is an arms-length independent organization that receives annual grant funding from the Climate Change and Emissions Management Fund to invest in projects and technologies that will result in greenhouse gas reductions in Alberta.	2009 - ongoing
The Green Transit Incentives Program (GreenTRIP)	GreenTRIP is a Government of Alberta capital funding program supporting new and expanded public transit throughout Alberta. This program aims to increase the accessibility and use of mass transit.	2008 - ongoing

Program	Description	Start/end date
Seniors Home Adaptation and Repair Program (SHARP)	This program provides low-interest home equity loans to help seniors finance necessary repairs, adaptations and renovations to their homes including the replacement of furnaces, hot water tanks and windows. A maximum loan of \$40,000 is available to seniors and senior couples with an annual total income of \$75,000 or less and who have a minimum of 25 per cent home equity in their primary residence.	2016 - ongoing
Alberta Indigenous Community Energy Program (AICEP)	This pilot program provides tools and funding to help Indigenous communities understand how energy is used in their buildings and identify opportunities to save energy and financial resources. It includes a detailed energy assessment that will support community decision making, estimate energy savings, and greenhouse gas reductions if building retrofits are completed in the future.	2016 - ongoing
Alberta Indigenous Solar Program (AISP)	This pilot program provides grants to Alberta Indigenous communities or organizations to install solar photovoltaic (PV) systems on facilities owned by the community or organization.	2016 - ongoing

Appendix G: Energy Related Innovation, Research and Development Commercialisation at Alberta Universities, Institutes and Colleges.

Many of the Province of Alberta's post-secondary institutions are actively involved in innovation, research and development and commercialization of technologies relevant to climate change and the specific interests of Energy Efficiency Alberta, in many cases winning highly competitive federal and provincial awards. For example, two major new initiatives have been launched at the University of Alberta and the University of Calgary thanks to two \$75 million investments from the federal government:

Future Energy Systems Research Initiative (FESRI) – University of Alberta

The University of Alberta's *Canada First Research Excellence Fund* (CFREF) grant of \$75 million will establish the Future Energy Systems Research Initiative (FESRI). The University believes that the *Future* begins today, which means the efficiencies of current processes of energy supply will be researched, while working on the technological and social innovation needed to transition to a low-carbon society in the longer term. The areas of renewable and alternative *Energy* generation and use FESRI will address include biomass (starting with agricultural, forestry, municipal solids, and sewage sludge materials), wind, geothermal (for heating, power, and cooling), and solar (for direct conversion to power and fuels). With respect to existing hydrocarbon energy sources, research will focus on advanced reservoir management (i.e., the digital oilfield) and in-field partial upgrading methods to reduce overall greenhouse gas emissions. The approach that will be taken is *System*-wide, including topics of smart grid and energy storage technologies, so that implementation of innovation for intermittent renewables can be adopted while meeting society's expectations of reliability.

The FESRI captures the full innovation continuum from basic research to create the disruptive knowledge for the longer energy timelines, to the development of emerging technologies that are approaching full commercialization, and to fully participate in demonstration-scale industry-driven renewable energy projects so that the institute can have an impact today. As part of all these activities, it is important to recognize the training of highly qualified personnel that contribute to diversifying Alberta's economy while contributing to the Alberta Jobs Plan.

The university believes that the scope and approach adopted by FESRI aligns very well with the province's innovation agenda. The institute will be performing research and development on future-centred technology and commercializing innovative processes and products while helping industry solve their current challenges. Besides the technology itself, FESRI will integrate these activities with humanities and social sciences research to help decision-makers advance policy and regulation for transitioning the energy mix to ensure economic success and social acceptance.

Global Research Initiative in Sustainable Low Carbon Unconventional Resources - University of Calgary

The University of Calgary notes that the transition to a low-carbon energy economy poses significant challenges for the responsible development, distribution and use of Canada's unconventional hydrocarbon resources, from oil sands to shale gas to mitigation of carbon emissions. As a leading clean energy technology research university, the University of Calgary was recently awarded \$75 million under the *Canada First Research Excellence Fund* for the Global Research Initiative in Sustainable Low Carbon Unconventional Resources. This CFREF award aims to transform how energy is derived from unconventional oil and gas reservoirs so that resource intensity is reduced and climate targets are achieved.

The new research program strengthens ongoing energy research at the University of Calgary that applies advanced science and engineering technologies to improve current extraction and production approaches - the results of which will enable Alberta and other jurisdictions to meet the global demand for sustainable energy resources while maximizing economic opportunities for resource development. These efforts will enable improved energy efficiency through accelerated development and deployment of clean energy technologies.

Environmental and economic benefits will derive from reduced resource requirements and new ways to lower carbon emissions while enhancing production. With new partnerships (locally and globally) and research advances made possible by the CFREF award and the University of Calgary's broader energy research strategy, the university hopes to enhance sustainability and accelerate Canada's economic development in the energy sector.

The University of Calgary's CFREF research strategy builds on the university's *Energy Innovations for Today and Tomorrow Research Strategy* that comprises the cross-disciplinary strengths of 270 researchers, 26 research chairs and more than 10 industry-sponsored projects taken up each year to optimize fossil fuel supply chains – while boldly innovating energy systems that are low or even zero carbon.

Applied Research in Institutes and Colleges

Relevant activities in other post-secondary institutions include the SAIT Green Building Technologies (GBT) research division. The GBT research division “brings together researchers with industry partners to identify and develop environmentally friendly technologies, processes, programs, systems and services that will fundamentally change the way we build, educate and develop skilled labour.” The NAIT Alternative Energy Program provides for applied research projects to be undertaken by its students and has conducted research in solar array efficiency in various locations in Alberta. Lakeland College has also conducted a range of applied energy research projects including several projects in renewable and alternative energy systems and storage completed with funding from NSERC.



Assisting Communities to Transition Toward and Take Action on Energy Efficiency

Recommendations for Alberta's Energy
Efficiency Advisory Panel

Date: September 12, 2016

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BACKGROUND

Over the past five years, Efficiency Nova Scotia has worked with more than 100 local partners to help 225,000 program participants complete energy efficiency projects, saving Nova Scotians \$110 million in 2016 alone and preventing the release of 590,000 tonnes of GHG emissions annually.

Efficiency Nova Scotia Corporation was established in 2010 to manage electricity Demand Side Management or DSM initiatives within Nova Scotia. These initiatives were funded by a DSM charge on electricity bills. In 2014, legislative changes required DSM initiatives to be provided by a franchise holder. The franchise holder, now known as EfficiencyOne, has the exclusive right to supply Nova Scotia Power with reasonably available, cost-effective efficiency and conservation activities for a ten-year term. The Efficiency Nova Scotia franchise is a public utility regulated by the Nova Scotia Utility and Review Board, which approves agreements between Nova Scotia Power and EfficiencyOne on the level of DSM activity. The cost of these activities is included in electricity rates.

EfficiencyOne Services was established in 2015 to bring EfficiencyOne's experience and expertise to more people and places.

EfficiencyOne Services was asked to develop a concise, 1-2 page paper outlining tools and recommendations for Alberta's Energy Efficiency Advisory Panel, "[...] to assist communities to transition toward and take action on energy efficiency."

Over the past five years, EfficiencyOne, formerly Efficiency Nova Scotia Corporation, has commissioned independent research to assess the attitudes of Nova Scotians and determine best practice in terms of education and outreach to build awareness and knowledge of energy efficiency and to promote uptake of its programs and services. EfficiencyOne has also interviewed similar organizations in other, leading energy efficiency jurisdictions, including Oregon Trust and Efficiency Vermont.

Recommendations for the Advisory Panel's consideration are summarized below and ordered with timing considerations in mind, starting with recommendations considered to be the most time-sensitive. In general, work to implement the activities outlined below should begin as soon as possible and operate simultaneously. A robust strategy to build awareness and drive program uptake is vital to achieving energy saving targets, in both the short- and long-term.

RECOMMENDATIONS

1. Aggressively position Energy Efficiency Alberta as the agency responsible for promoting and supporting energy efficiency efforts.

- Building awareness and knowledge of Energy Efficiency Alberta is critical to the success of the organization's mandate, and will reinforce the importance of energy efficiency action.
- Early investment in awareness-building is important, and helped build a culture of energy efficiency in Nova Scotia. For example, spending on marketing, education and outreach initiatives typically comprises 5-7% of Efficiency Nova Scotia's annual

operating budget. While providing rebates and other incentives is critical to help Nova Scotians take action on energy efficiency, it must always be balanced with robust investment in marketing and outreach initiatives that help educate and inspire Nova Scotians to embrace energy efficiency as a new way of thinking.

- Education and outreach efforts should focus on the basics of what the organization does (e.g. program information, information explaining how to save energy). Efficiency Vermont further recommended starting modestly and piloting approaches in different markets, rather than trying to cover all audiences right away. It will be important to select a strong media partner who understands the Alberta market, how Albertans consume information, and how to reach your target audiences as cost-effectively as possible, but who also has a strong knowledge of analytics and can use insights to refine your approach.
- As with any new organization, the ability to deliver on promises and manage expectations is critical to success. Energy Efficiency Alberta should ensure it has capacity to support the demand generated by awareness-building and outreach efforts in order to maintain high levels of customer engagement and satisfaction.

2. Develop a robust marketing and communication strategy that employs a variety of tools.

- Direct communications from Energy Efficiency Alberta employees are important. Past interviews with Efficiency Nova Scotia stakeholders cite direct communications from employees and the corporate website as the two most important sources of information about the organization; they also received the highest ratings from stakeholders in terms of usefulness. EfficiencyOne, under the Efficiency Nova Scotia brand, meets with customers across the province at home shows, trade shows, and various community events throughout the year, and staff also travel throughout the province to speak at conferences and present to business associations, community groups, senior groups, etc. Evaluations have repeatedly shown that these activities positively impact both visitors' attitudes towards Efficiency Nova Scotia and visitors' participation in energy efficiency actions. Similarly, Oregon Trust emphasized the importance of visiting communities to get the word out, and also hosts an annual conference for stakeholders and customers.
- EfficiencyOne also employs a team of four Energy Solutions Advisors offering information, expertise and advice to customers directly by phone or email. This service is a key component of Efficiency Nova Scotia's brand offering, and a driving force behind the organization's 90+ customer satisfaction rating over the past five years. In addition, Business Development Managers directly engage large commercial, industrial and institutional customers, as these customers often have unique needs and can be difficult to reach through mass marketing efforts.
- News releases, Annual Reports, newsletters and social media activity are also important methods of sharing information with customers and stakeholders and raising general awareness about Energy Efficiency Alberta and its activities. In its first full year

of operations, Efficiency Nova Scotia launched a campaign involving two of the largest brands in Canada to get Nova Scotians to pledge to save energy and to “like” Efficiency Nova Scotia on Facebook. Within two weeks, Efficiency Nova Scotia’s Facebook presence grew from just 150 people to 15,000, making it triple the size of the next largest corporate Facebook site in Nova Scotia at the time. This is just one example of how tools like social media can be leveraged to quickly reach your target audience and create ambassadors.

- Legislative outreach is another key component of most leading jurisdictions’ communication and outreach strategies. Efficiency Vermont, for example, gives introductory presentations to key committees (e.g. energy, commerce and economic development) and sets a goal to speak to a number of committees each year whose interests align with energy efficiency (e.g. agriculture, education). EfficiencyOne meets with all MLAs and MPs in their constituency offices to provide an overview of its programs and services, and maintains regular communications through phone calls, newsletters, and caucus presentations to ensure that legislators understand the benefits of energy efficiency and have relevant program information to share with their constituents.

3. Communicate a clear rationale for the carbon levy and the benefits for the average resident.

- Unless the benefits to the average resident are understood and accepted, Albertans may become increasingly resentful of the carbon levy, undermining support for the work of Energy Efficiency Alberta.
- Research conducted in Nova Scotia in 2011 found that residents had a generally low level of awareness and support for the energy efficiency charge on electricity bills. In response, Efficiency Nova Scotia developed a specific strategy to address this issue, focused on communicating the benefits that all Nova Scotians receive in return for funding energy efficiency efforts. While the energy efficiency charge was removed from electricity bills in 2015 and is now included in electricity rates, the investment in funding energy efficiency efforts, and the average resident’s perceived return on that investment, continues to be a challenge.
- Energy Efficiency Alberta should consider assessing the awareness of and support for the carbon levy, and develop a strong case to support the levy, focusing on the benefits that all Albertans will receive from their investment in energy efficiency actions, as well as the benefits they will receive personally due to energy efficiency programs. This message should be proactively and aggressively communicated in interactions with customers and stakeholders.

4. Invest in building the Energy Efficiency Alberta brand to help address barriers to energy efficiency action.

- Over the past five years, Efficiency Nova Scotia has partnered on a number of research projects to better understand its customers and barriers to participating in energy efficiency activity. Generally speaking, barriers to participation fall into three

main categories: lack of time, lack of knowledge, and lack of money. Understanding barriers to participation is not only critical to successful program design and delivery, it is an important part of building the Energy Efficiency Alberta brand and will help shape the organization's marketing and outreach activities.

- The Efficiency Nova Scotia brand, for example, is based on research showing that Nova Scotians desired an energy efficiency organization that could help connect them to the expertise, guidance and resources they need to take action. Energy Efficiency Alberta should consider investing in brand building research that will help determine how the organization is viewed by the public, what Albertans need to take energy efficiency action, and how the organization can best respond through its marketing, education and outreach activities.
- In addition, Efficiency Nova Scotia conducts quarterly surveys to track awareness of and support for the organization over time. These form important indicators of the success of the organization's marketing and outreach efforts. Energy Efficiency Alberta should consider similar, ongoing research to measure the success of its marketing and outreach efforts over time.

5. Seek out and form strategic partnerships.

- Strategic partnerships are an effective way to promote your organization and build credibility with new audiences. Trusted partners who can reinforce the message of Energy Efficiency Alberta and act as ambassadors for energy efficiency are invaluable and will help strengthen the work you are trying to do.
- Energy Efficiency Alberta should consider engaging partners in various communities and industries to help reach key audiences. Over the years, Efficiency Nova Scotia has sponsored partnerships with organizations like the Nova Scotia Homebuilders' Association, Discovery Centre, Ecology Action Centre, and Habitat for Humanity to help build awareness of energy efficiency and encourage participation in its programs and services. As well, the organization has successfully engaged municipal permit offices, financial institutions, and others to carry promotional materials on Efficiency Nova Scotia programs.
- Over time, partnerships can be expected to develop and evolve with the organization's mandate. For example, Efficiency Nova Scotia currently sponsors courses in two universities – Dalhousie University and Saint Mary's University – to help educate post-secondary students about energy efficiency's role in the broader energy landscape and to help build awareness of careers in the energy efficiency industry.
- Similarly, developing partnerships with qualified contractors and other service providers in the energy efficiency industry is critical to help promote programs and build capacity to meet demand for energy efficiency upgrades, renovations and new construction. Many leading jurisdictions, including Nova Scotia, have formed trade networks and offer a variety of training and education programs to members to help them keep on top of industry trends and developments.

6. Promote cost savings *and* environmental benefits of implementing energy efficient actions.

- Clear communication about the benefits and availability of energy efficiency opportunities are required to increase Alberta's culture of energy efficiency and drive program participation. It is important for Albertans to not only understand how Energy Efficiency Alberta can help them, but also how taking action on energy efficiency benefits them, their community, and the province, both economically and environmentally.
- Research from Nova Scotia and elsewhere shows that short- and long-term cost savings, are an equally, if not more important motivator for energy efficient behaviour as protecting the environment and reducing greenhouse gas emissions. As a result, communicating both cost savings and environmental benefits is the most effective way to encourage energy efficient actions and influence decisions and behavior change.
- This includes educating residents and businesses about the impact of reducing energy use on costs and competitiveness, as well as the impact on the environment. Albertans should see and understand how energy efficiency benefits them directly – savings on their energy bills – as well as how it benefits Alberta overall – job growth in the energy efficiency sector, how bill savings are reinvested into the local economy, reduced greenhouse gas emissions, etc.

7. Reinforce the message of energy efficiency by demonstrating and commending what Albertans are already doing.

- Experience in Nova Scotia and other leading energy efficiency jurisdictions has shown that comparison can be an effective motivator for behavior change. Nova Scotia, for example, effectively uses the current efforts of residents and businesses to conserve energy to encourage other Nova Scotians to get involved in the efficient use of energy.
- Additionally, Efficiency Nova Scotia conducted focus group research that found that Nova Scotians responded positively to messaging about Nova Scotia's leadership in the area of energy efficiency and felt motivated by such a message to take further action.
- Alberta is not currently considered to be a leader in energy conservation. Energy Efficiency Alberta should consider challenging Albertans to become a leader in energy conservation, which will require some measurable basis of comparison to other jurisdictions to provide proof of long-term success and targets to be achieved. This is part of a call to action for residents and business to do their part in conserving energy and helping protect the environment.



CONTEXT

Alberta's Climate Change Office (ACCO) has been tasked with creating Energy Efficiency Alberta, a new agency responsible for promoting and supporting energy efficiency and community energy systems across the province. As is the case with other energy efficiency program administrators (PAs), Energy Efficiency Alberta faces the question of whether to **deliver the programs with in-house staff** (*full insourcing*), to **manage delivery by third parties** (*partial outsourcing*), or to **contract for turnkey program management and delivery** (*full outsourcing*).

In this memo, we offer some guidance on delivery models by addressing the following elements:

1. **Overview:** What can be outsourced?
2. **Benchmarking:** What are other jurisdictions doing?
3. **Key considerations:** In which context is one method preferable? What are some ramifications of each approach?

We conclude with a series of next steps.

DELIVERY MODELS: AN OVERVIEW

The delivery of energy efficiency programs includes a large number of activities, most of which can be outsourced to consultants, program implementers (installation, engineering, marketing, etc.), evaluators, and others. In this memo, we divide program activities into four buckets:

1. **Planning & Evaluation:** program design, regulatory obligations, opportunities assessment, etc.
 - Typically managed in-house, though several parts of the work can be—and often are—outsourced.
 - This includes hiring third-party evaluators to assess program impacts, or specialized consultants supporting program design and regulatory activities.
2. **Program Management:** administration, continuous improvement, contractor selection, etc.
 - Typically managed in-house, also with the possibility of outsourcing parts of the work, from consultants supporting the drafting of RFPs for contractor selection to marketing efforts.
3. **Program Delivery:** comprehensive delivery of a program, i.e. turnkey
 - In some cases, the entire program delivery may be contracted out to a third-party, from customer relationship management and measure installation to rebate processing.
4. **Service Delivery:** delivery of program components only
 - In some cases, components of a program are broken off and contracted out, such as home energy audits, while the rest remain in-house.

The decision to conduct activities in-house or outsource them rests on the **goals** and **context** of the program administrator, from internal capacity considerations to ramp-up timelines. Below, we briefly explore what other jurisdictions have decided for their delivery models.

DELIVERY MODELS: INSIGHTS FROM OTHER JURISDICTIONS

In Table 1, we list some available figures on the number of internal full-time employees (FTEs) in a given energy efficiency administrator organization, along with the latest DSM budget for normalization:

Table 1: Internal Full-Time Employees in Select Energy Efficiency Program Administrators*

JURISDICTION	# FTEs (internal)	DSM Budget (\$M)	Ratio of FTE / budget (internal FTEs/\$M)
Efficiency Vermont	125	54	2.31
Efficiency Nova Scotia	60	39	1.54
Hawaii Energy	34	38	0.89
Efficiency Maine	16	27	0.59
Energy Trust of Oregon	105	185	0.57

* **Note:** this information is for illustration purposes only. The consistency of the data (e.g. what is included in the budget, how FTEs are calculated) can vary significantly from one jurisdiction to the next. Budget figures include DSM program expenditures, but not necessarily shared expenditures that fall in other budget categories (e.g. if the broader utility marketing department handles DSM, this may not be reflected in the DSM budget figure). DSM budget figures are for 2015, with the exception of Energy Trust of Oregon, which is for 2016. Efficiency Nova Scotia's FTE count is only for its DSM FTE allocations in order to correspond to its DSM activities. Efficiency Vermont FTEs are an estimate, considering full-time staff as well as other VEIC employees dedicating only part of their time to Efficiency Vermont efforts. Some FTE figures were obtained through interviews with program administrator staff.

We note the following elements:

- **There is no one-size-fits-all approach:** The staff count of energy efficiency program administrators varies significantly from jurisdiction to jurisdiction. On a per-budget basis, Efficiency Vermont has more than three times, and Efficiency Nova Scotia almost three times, the in-house staff than Efficiency Maine or Energy Trust of Oregon. Yet all are recognized as successful in achieving strong levels of energy savings cost-effectively.
- **Efficiency Vermont mostly insources:** Efficiency Vermont (the first “energy efficiency utility”), managed by the Vermont Energy Investment Corporation (VEIC) under a strict performance agreement, outlined a vision whereby the organization would become experts in energy efficiency program delivery. As a result, the organization delivers most programs internally, with only limited outsourcing.
- **Energy Trust of Oregon and Efficiency Maine outsource significantly:** At the other end of the spectrum, these organizations call upon experts to help them plan and deliver programs. A cursory glance at their respective websites constantly reveals several RFPs/RFQs on the go. Their decision to choose a “light” model was made early on, for a combination of strategic and political reasons.
- **Efficiency Nova Scotia combines in-house and outsourced program management:** Efficiency Nova Scotia, managed by EfficiencyOne, uses a hybrid approach, outsourcing most program delivery and implementation such as installation and contractor work, home energy assessments, and consumer products programs. However, it processes rebates for most of its programs in-house, managing large individual projects for certain programs, and approving eligible work and applications for other programs.

These organizations have all managed to deliver energy savings—with an often different set of challenges. In the next section, we turn our eyes to Alberta and explore some considerations related to these delivery models.

DELIVERY MODELS: KEY CONSIDERATIONS

In selecting a delivery model for its upcoming programs, Energy Efficiency Alberta faces a unique context:

- **Timelines are very short:** Energy Efficiency Alberta is under very tight timelines, with its inaugural programs slated to be launched in early 2017. The organization has yet to be fully set up, staffed, trained, and processes developed.
- **Energy Efficiency Alberta will operate as a crown corporation:** Crown corporations are subject to specific requirements in terms of staffing, which may hinder a swift ramp-up (or ramp-down) effort. This model is significantly different than, for example, utilities or independent entities that may have more flexibility in hiring processes, performance assessments, and even salaries.
- **Alberta has an entrepreneurial, market-friendly culture:** Historically, Alberta has often favoured free-market, open-competition solutions. Outsourcing program activities to the private sector is not likely to cause backlash.
- **In-province expertise remains limited at this time:** Alberta is relatively new to energy efficiency. Outsourcing program administration activities would likely lead to out-of-province firms winning contracts, at least in early days. With time – and deliberate effort – this expertise can be built up in the province.

Building on this context, we offer a set of considerations for Alberta as it makes its initial strategic decisions.

OVERALL GOALS

- *Consider Alberta's goals and the importance placed on ramp-up speed, in-province capacity building, and longer-term market transformation. In other words, what is the vision for Energy Efficiency Alberta?*

Overall, the vision for Energy Efficiency Alberta should drive the decision to insource or outsource.

It is easier to ramp up by **outsourcing**: Experienced third parties can offer tailored, practical solutions at a relatively fast paced ramp up (given a RFP that is strategically drafted), with deep knowledge of experience in other jurisdictions. Similarly, it is simpler to set clear performance metrics for outsourced services than for in-house staff, and thus to secure energy savings within a quicker timeframe.

At the same time, **insourcing** can help build in-province capacity, by building (or importing) expertise in Alberta. Similarly, in-house staff *may* be able to keep a closer eye on longer-term market transformation; when outsourcing, longer-term goals are often under-prioritized in favour of more near-term and/or more easily-measurable metrics such as energy savings targets (that said, a well-designed market transformation strategy *can* be designed with external partners).

PERFORMANCE

- *Consider Energy Efficiency Alberta's flexibility, or lack thereof, for staffing*

Building in-house expertise requires significant flexibility in terms of staffing: the ability to hire the right people at the right time, to let go of employees who are not meeting performance expectations, and to build a compensation structure that is in line with the organization's goals.

With considerable flexibility, there may be value in building expertise in-house. However, if the program administrator must follow government hiring and other human resource requirements, outsourcing may provide more flexibility in producing the energy savings that the government, as well as utilities and their regulator, are counting on in their own planning processes.

- *Outsourcing does not necessarily lead to 'open competition' over the long term*

The first bid winner often wins it for the long term. Indeed, while initial RFPs for select program administrator support services—from program delivery to initial planning—leads to an open and fair competition, the ensuing RFPs for the same services are often much less competitive, as the incumbent gains unique experience, insights and market knowledge. In Vermont, where VEIC won the first RFP against several competitors, it faced only a single competitor six years later during the second RFP. On the assumption that competition was no longer possible, the state modified the law prior to the third planned RFP in order to grant VEIC a delivery monopoly (countered by greater regulatory oversight).

While the Vermont example is extreme (larger states have maintained a degree of competition), it certainly argues, at the very least, for contracting with other firms for critical planning functions and market studies.

- *Knowledge transfer will not happen by itself—it must be explicitly mandated*

If Alberta wishes to outsource now but transfer knowledge later, consider making that a very specific requirement, and perhaps a strongly-weighted selection criterion, in RFPs. This should be accompanied by a clear knowledge transfer plan to articulate both the needs and expectations on both ends (the plan can also support – and/or be integrated within – a broader market transformation strategy). Without a clear plan and contract for knowledge and capacity transfer, third-party organizations are not likely to deliver, regardless of initial assurances.

- *Measurability offers both value and pitfalls for an outsourcing model*

With outsourcing, it is relatively simple to set clear performance metrics by which to judge performance and compensation. However, elements that are more difficult to quantify (capacity building, market transformation, and other long-term metrics) may fall through the cracks or at most be under-prioritized. Here again, this highlights the importance of thinking RFPs through at the outset and, more broadly, developing a clearly-articulated plan.

NEXT STEPS

In sum, at this stage we suggest that Alberta consider the following next steps:

1. **Outline your vision for Energy Efficiency Alberta**, and consider the relative importance of ramp-up time, performance measurement, and in-province capacity building;
2. **Take a realistic look at your staffing flexibility** and your ability to build a nimble team for the task;
3. **If outsourcing, think through the set of criteria in the RFPs**, to ensure performance, knowledge transfer, and other long-term goals.

Given the tight timeline, a decision should be made in the short term for the inaugural programs. However, there is time to adjust course as the program portfolio expands.



CONTEXT

Alberta's Climate Change Office (ACCO) has been tasked with creating Energy Efficiency Alberta, a new agency responsible for promoting and supporting energy efficiency and community energy systems across the province. The agency was granted an inaugural budget of **\$645 million over five years**, in a bid to kick start the delivery of energy efficiency programs in the province and achieve both energy savings and greenhouse gas (GHG) emission reductions. The management of these funds—the scale and ambition of the programs relative to others, as well as their cost-effectiveness—will inevitably be the subject of scrutiny, both from the formal oversight process and the broader industry. Simply put, comparing results across jurisdictions is part and parcel of the energy efficiency (and climate mitigation) field.

In this memo, we offer some insight on the level of effort in other jurisdictions:

1. **Overview:** how can efforts best be compared?
2. **Benchmarking:** how are other jurisdictions doing?
3. **Key considerations:** what does this mean for Alberta?

These considerations may help inform Alberta's own ambitions and target-setting process.

BENCHMARKING: AN OVERVIEW

Benchmarking efforts across jurisdictions is more complex than it seems. In order to be helpful in drawing conclusions, the analysis must consider **relevant metrics** and **relevant regions**; it must also contain both **comparable** and **accurate data**. We address some of these elements below.

What are some relevant metrics?

No single metric is a perfect reflection of performance or effort in energy efficiency. However, over time, three metrics have been used to reasonably, albeit imperfectly, provide comparisons between regions:

- **EFFORT – Investment over load or sales (\$/MWh sales or \$/GJ sales):** This metric relates the investment into energy efficiency programs to the size of the overall market, i.e. total energy consumption;
- **SUCCESS – Savings over load or sales (%):** Analogous to a firm's market share, this metric relates energy efficiency performance to the size of the overall market, and is the most common metric for comparing goals and achievements;
- **COST – Unit Cost of (first-year) energy savings (\$/kWh saved):** Analogous to a firm's per-unit cost of sales, this metric provides a clear indication of the cost of procuring DSM.

We should note that **none of these metrics speak clearly to the net economic benefit** (analogous to a firm's bottom-line returns) because they do not account for the value of their associated savings or, specifically, their avoided costs. While this is an important indicator of the value of energy efficiency, it is not appropriate

for benchmarking purposes, insofar as the economic value is determined primarily by factors entirely outside of the control of the program administrator (e.g. the economic value of avoided power plants).

Given Alberta's emphasis on GHG emission reductions, another metric could be the **cost of abatement (\$/tonne CO₂e reduced)**. This is similar to the cost of energy savings, except that, as with economic benefits, its denominator is highly dependent (in the case of electricity savings) on the unique characteristics of each region's power supply mix. For example, the cost of abatement associated with energy efficiency programs will, by definition be far cheaper in Alberta than in, say, Quebec, for reasons having nothing to do with Energy Efficiency Alberta's relative successes or failures.

What about investment per capita?

It can be tempting to compare overall energy efficiency budgets (say, Energy Efficiency Alberta's budget of \$645 million over five years) by simply normalizing them by population. In essence, a spending per capita metric tells us how much a program administrator or a region is spending overall—including budgets allocated to homes; apartment buildings; small businesses; large businesses; federal, provincial and municipal public sector buildings; and industrial customers, both large and small—and then compares it with the number of individuals living in the province.

However, since each province or state has a different mix of non-residential buildings, a different industrial base, and a different public sector building mix, in addition to different shares of single family and multifamily type housing, this comparison is of little if any value.

Which jurisdictions are relevant?

Benchmarking analyses can lead to different narratives depending on the sample of jurisdictions selected. It can be easy to paint a jurisdiction as a relative leader when compared to lagging jurisdictions—a feel-good outcome, but of limited value in terms of continuous improvement.

Overall, while no two jurisdictions are the same, there is significant value in comparing efforts with **peers**, i.e. jurisdictions that have somewhat **similar goals or aspirations**. For instance, there is limited value in comparing energy efficiency initiatives with a U.S. state that ranks last in American Council for an Energy Efficient Economy (ACEEE) scorecards – the outcome is predictable. However, there *is* value in comparing efforts with jurisdictions that exhibit close **geographic proximity** (to account for climate), or a **similar structure** (e.g. comparing Efficiency Nova Scotia with other special-purpose entities such as Efficiency Vermont or Energy Trust of Oregon). These last two elements, however, would significantly narrow the field (especially in the case of a crown corporation such as Energy Efficiency Alberta), and should be used carefully.

In the next section, we offer a brief look at the key metric for which we are able to benchmark Alberta at this time: planned investment in energy efficiency as a function of energy sales. We then provide additional metrics to provide some context for Energy Efficiency Alberta as it initiates and begins to ramp up its activities.

BENCHMARKING: INSIGHT FROM OTHER JURISDICTIONS

The Dunsky team was tasked with benchmarking Alberta’s anticipated level of investment with other jurisdictions. To ensure comparability, we benchmark investment as a function of total energy sales, outlined in Figure 1 below.

One challenge with this benchmark is that Alberta’s funds are currently earmarked for savings from *all* energy sources, including transportation and community-scale renewables, whereas efforts elsewhere are focused solely on energy savings from electricity and natural gas. To account for this, we have assumed that by Year 5 85% of Alberta’s funding will be directed to this more traditional area of investment. Of course, actual spending in gas and electric efficiency may differ.

Because Energy Efficiency Alberta is not yet administering programs and will require a ramp-up period, we are providing results from its anticipated Year 1, as well as Year 5, investment. Note that both years are compared against 2016 planned years for other jurisdictions, as this is the year for which details are available. Jurisdictions were selected based on their administration of both natural gas and electric energy efficiency programs; results reflect a consolidation of both activities.

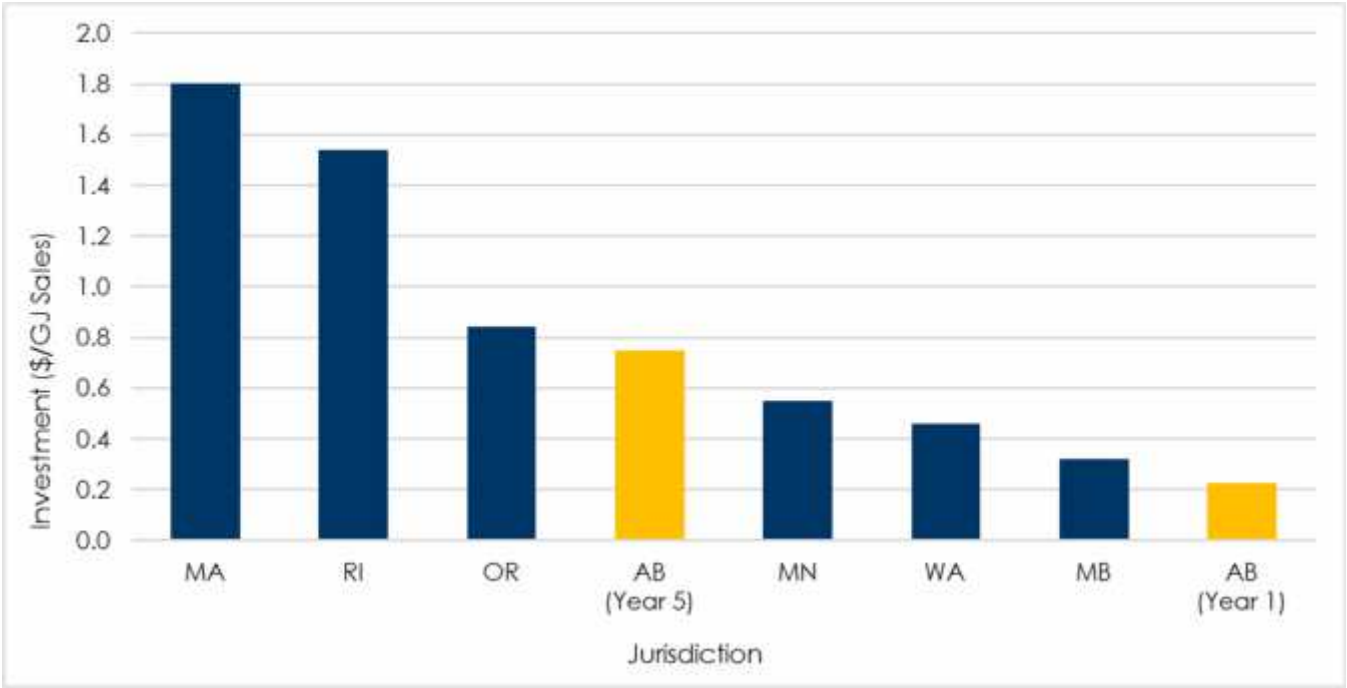


Figure 1: 2016 planned investment per unit of energy sold (excluding transportation)¹

¹ Alberta’s numbers based on 2015 electricity and natural gas sales/consumption compared against 2017 (Year 1) and 2021 (Year 5) investment expectations, respectively. Year 1 includes no transportation programs per expected program design; the Year 5 investment forecast has been reduced by 10% to account for an assumption that no more than 10% of the budget will be allocated to transportation.

We highlight the following from this metric:

- **Alberta's expected Year 1 investment is comparable to the lower level of investment in leading jurisdictions.** Given that Energy Efficiency Alberta is not yet in market, this anticipated investment is ambitious and will position the province among the leaders in North America.
- **Alberta's expected Year 5 investment is among the leaders of investment in energy efficiency.** Once its ramp-up is complete, the agency will likely be positioned as a leader in North America in its level of energy efficiency activity, leading to GHG emissions reductions and energy savings that should have a significant contribution to Alberta's climate-change goals.

ADDITIONAL METRICS

As with all benchmarking exercises, the above results should be taken as illustrative only: they do not provide insight into the factors influencing particular outcomes or, in the above example, specific results. For this reason, we are providing additional, select benchmarking analyses in the following pages. While Alberta does not yet have specific targets and is therefore not included, by providing additional benchmarking analyses, the agency will have information on which to develop its own policies and stated goals, as well as an understanding of the metrics obtained by other jurisdictions.

We begin with **electricity savings targets as a percentage of load**:

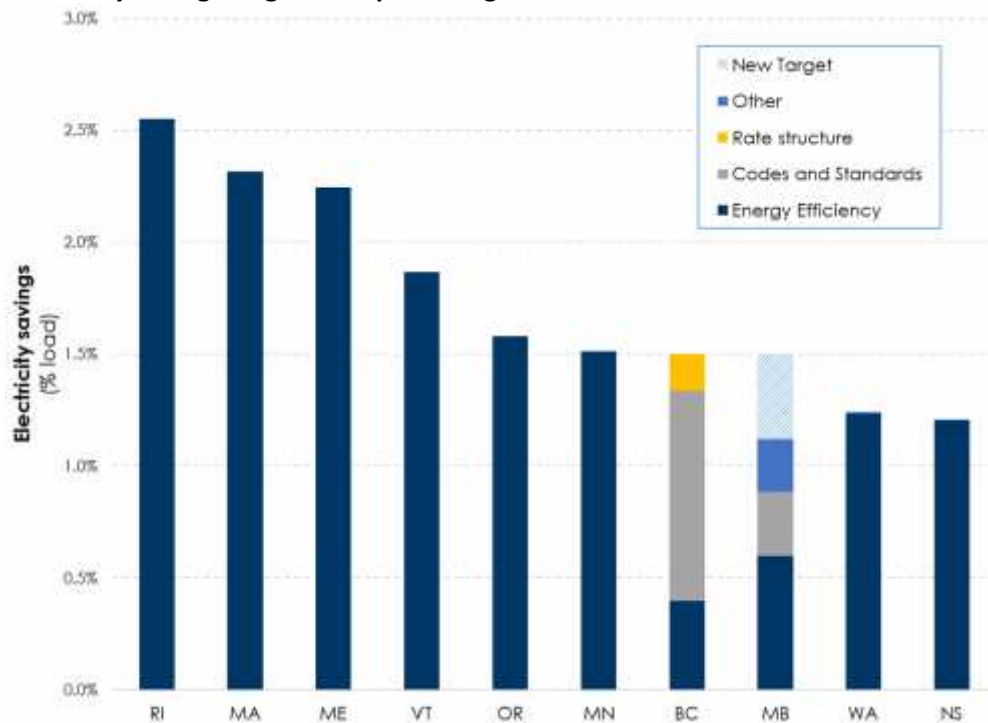


Figure 2: Electricity savings targets (2015+), as a % of load²

² Based on a review of individual DSM Plans and the 2015 ACEEE State Energy Efficiency scorecard.

We highlight the following from this metric:

- **Most energy efficiency leaders aim for savings well above 1% of load.** Leading program administrators tend to aim for savings targets in the 1.0-2.5% range, including both jurisdictions that are relatively new in the market and those that have seen energy efficiency activity for many years and could be deemed “mature”.
- **Not all targets are created equal.** Some program administrators include elements beyond energy efficiency in their DSM targets, such as codes & standards, rate structure (e.g., time-of-use rates), demand response (DR), or other elements, such as fuel switching or alternative energy generation. The methodology to calculate savings may also vary significantly from one jurisdiction to the next, with differing approaches to net-to-gross ratios, interactive effects, and others.

Once its ramp-up is complete, Energy Efficiency Alberta may be expected to achieve similar electricity savings levels or specific GHG emission reduction targets. But as noted in considerations later in this document, a potential study would help ascertain this.

A similar exercise may be conducted for **gas savings targets as a percentage of load**:

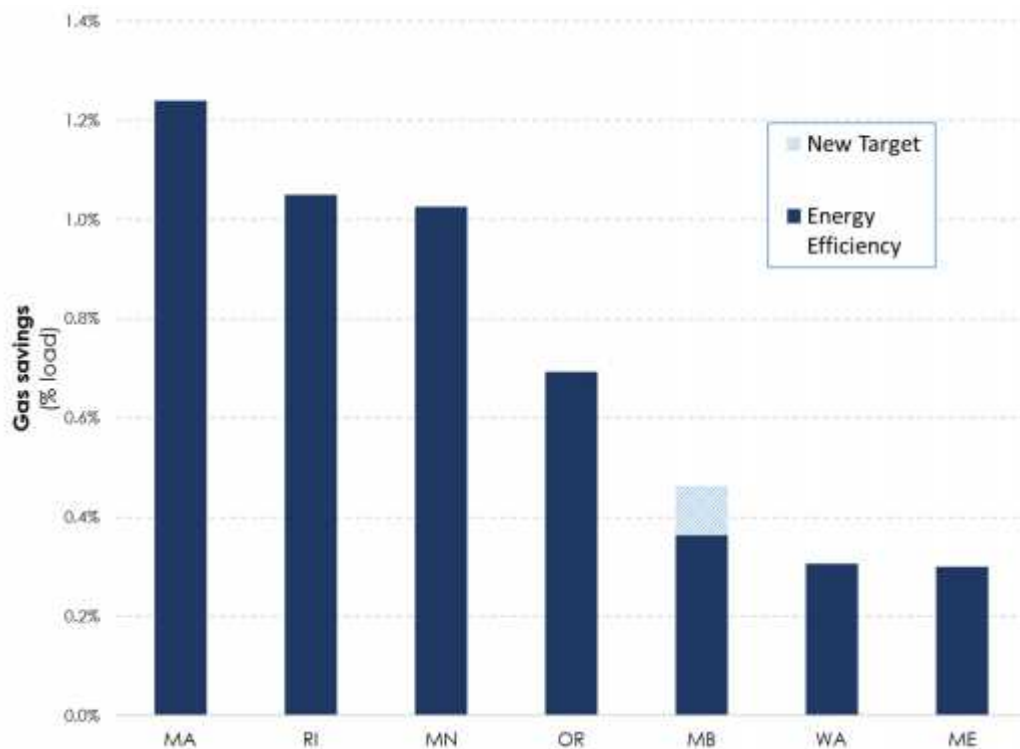


Figure 3: Gas savings targets (2015+), as a % of load³

³ Based on a review of individual DSM Plans and the 2015 ACEEE State Energy Efficiency Scorecard of jurisdictions with mandated natural gas targets.

In Figure 3, we illustrate the **unit cost of energy efficiency (electricity)**, expressed in \$ per first-year kWh savings (and listed against the savings target as % load):

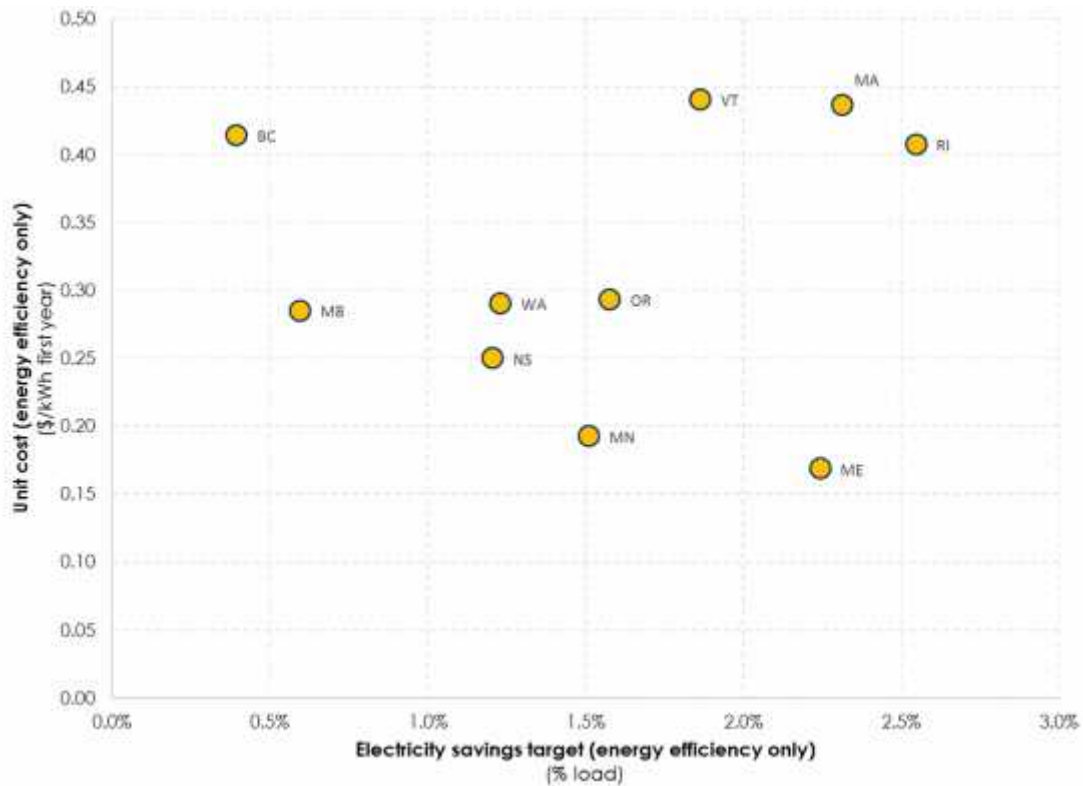


Figure 4: First year unit cost, relative to electricity savings target⁴

We highlight the following from this metric:

- **Unit costs vary significantly from jurisdiction to jurisdiction.** The cost of saving energy is subject to a suite of local factors, from local electricity rates to labour costs. A comparison among a subset of similar regions can help provide further context.
- **There isn't a perfect correlation between savings targets and unit costs.** Some jurisdictions manage to achieve higher savings levels at a lower cost than others. Some of this may reflect efficiencies, and some of it may reflect regional differences in how costs and savings are calculated.
- **There is also value in comparing unit costs at the individual program level.** The figure above highlights the average unit cost for a full program portfolio. Delving in more detail (by sector, by program type) can also help gain insight on the performance of a given program. For example, jurisdictions that invest significantly in low-income programs could have a higher overall unit cost than those that do not.
- **The “first-year” unit cost metric is flawed,** in that it implicitly assumes that all DSM plans’ savings share roughly the same lifespan. While this once was true, the growing role of behavioural and operational

⁴ Based on a review of individual Demand Side Management (Energy Efficiency) Plans.

savings means that estimate useful lives of savings can now vary significantly. While a more appropriate metric would compare the *levelized* unit cost of *lifetime* savings, these data are not always available.

Lastly, for illustrative purposes, we offer a comparison of **energy efficiency budget proportions by sector, for North American program administrators:**

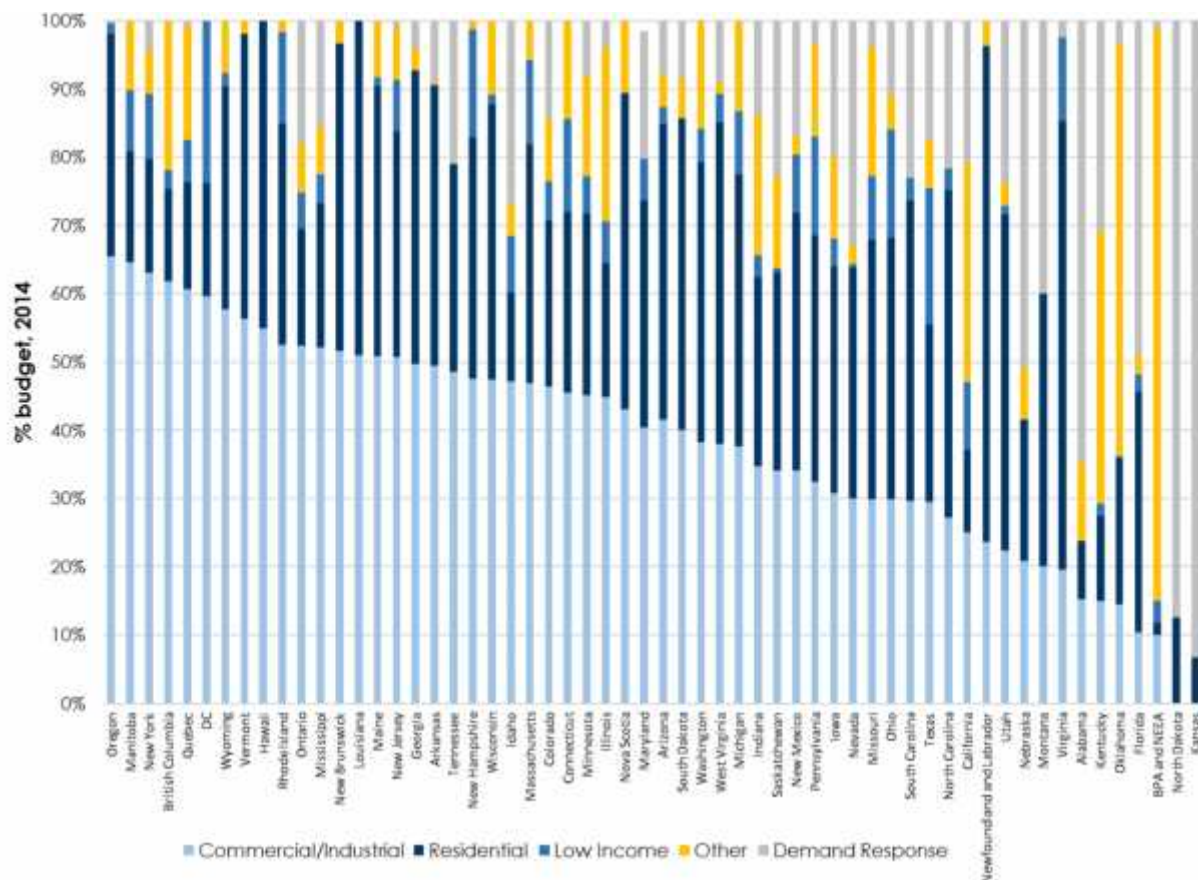


Figure 5: DSM Budget Proportion by Sector, 2014⁵

The figure above clearly highlights the **pitfalls** of drawing strong conclusions from benchmarking budgets by jurisdiction: program portfolios vary significantly, depending on the underlying structure of the built environment, goals and priorities, as well as market maturity. Importantly, budget figures do not provide information on the **results** from these investments—a critical component.

BENCHMARKING: KEY CONSIDERATIONS

Energy Efficiency Alberta is being created with the intent of investing a substantial budget. The output resulting from the use of these funds will be subject to close scrutiny on a continuous basis. Below we offer some key considerations for Alberta, as it seeks to understand its place in the broader energy efficiency (and GHG mitigation) ecosystem:

⁵ Based on data from CEE, *Efficiency Program Industry by State and Region, 2014*.

- *Detailed potential studies help understand your own market and benchmark against yourself*

Targets are best informed by an understanding of the *potential* for energy savings (or GHG emission reductions) in a given market—especially for a new market such as Alberta. Potential studies help identify *technical* (the theoretical maximum), *economic* (the subset of the technical potential that is cost-effective), and *achievable* (the subset of the economic potential that can realistically be expected to be achieved under a set of opportunities and constraints) energy savings or GHG emission reductions. Understanding this potential can help *compare targets against yourself*, and contextualize the level of efforts that are required—well before you look at other jurisdictions.

- *Be wary of benchmarking future plans with past results*

A fair benchmarking exercise needs to focus on the same time period, especially given that the baseline for savings is constantly shifting. We offer an example below.

In the past several years, a renewed interest in, and adoption of, energy codes and standards has increased baseline energy performance. At the same time, new technology options offer different savings characteristics. A prime example of this is lighting, for which new Canadian and U.S. standards came into effect over the last couple of years. These new standards will dramatically increase the forward-looking performance of lighting across the residential and small commercial sectors. As a result, savings from CFLs, while still often cost-effective, will be lower than they once were. On the other hand, higher-performance LEDs have come down in cost, creating a new opportunity for lighting that is cost-effective on a lifetime basis, given their much longer useful lives. Yet on a \$/kWh_{v1} basis (i.e. a metric that accounts for first year savings only), LEDs would appear very costly, putting upward pressure on this particular metric.

In this context, we should be careful not to draw strong conclusions from a comparison of others' past performance to Energy Efficiency Alberta's future plans.

- *Avoid spending per capita metrics*

It could be tempting to compare Energy Efficiency Alberta's budget with that of other program administrators on a per capita basis. As noted earlier, we caution heavily against this, as it does not consider the difference in the local built environment, nor does it consider output (which, again, is the key goal of any investment).

Energy Efficiency Alberta is just getting started. Benchmarking with other jurisdictions can help offer guideposts as it develops its plan; but just as importantly, keeping its eyes on the ball—its own potential and targets—will most help realize its goals.



CONTEXT

Alberta's Climate Change Office (ACCO) has been tasked with creating Energy Efficiency Alberta, a new agency responsible for promoting and supporting energy efficiency and community energy systems across the province. This new crown corporation is only one piece of the new energy efficiency ecosystem in the province: a **robust oversight process** is also required to help inform the design and optimization of the agency's activities, and to assess its performance against certain targets.

In this memo, we offer some guidance on two key sets of questions surrounding the oversight of energy efficiency program administrators (PAs) in general, and Energy Efficiency Alberta in particular, namely:

1. **Oversight model:** how does it all work?

In this section, we explore the key elements of the oversight process, including the main actors, the evaluation process (who hires the evaluator, and for what types of evaluation), the regulatory review process, and the role of stakeholders.

2. **Key performance indicators:** what metrics do we track and evaluate against?

In this section, we explore the overarching targets against which PAs are assessed, along with considerations on associated key performance indicators (KPIs), cost effectiveness testing, and levels.

In each section, we offer some insights from other jurisdictions, along with considerations that are specific to the Alberta context. We conclude by summarizing the next steps.

OVERSIGHT MODEL: AN OVERVIEW

Overseeing the activities of energy efficiency PAs is a best practice. Existing oversight processes vary by jurisdiction, but contain a few common elements, illustrated on Figure 1 on the next page. Key actors include:

- **Government**
Key roles include setting targets and the regulatory framework, as well as both informing and monitoring the regulatory review process, through its relationship with the Regulator.
- **Regulator**
Key roles include assessing and approving the demand-side management (DSM) Plan, assessing and approving the Evaluation Plan, reviewing the evaluator's report (on its own or with the help of external experts), and informing the government on progress with respect to targets.
- **Program administrator**
Key roles include drafting the DSM Plan and Evaluation Plan, taking part in the evaluation (either through its internal evaluation department, or more commonly by hiring/overseeing an external evaluator), and working to achieve the government's targets through the delivery of programs and services.
- **Evaluator**
Key roles include evaluating the program administrator's programs, with respect to their impact (how they measure to targets), and sometimes in terms of the process (how efficiently they are run).

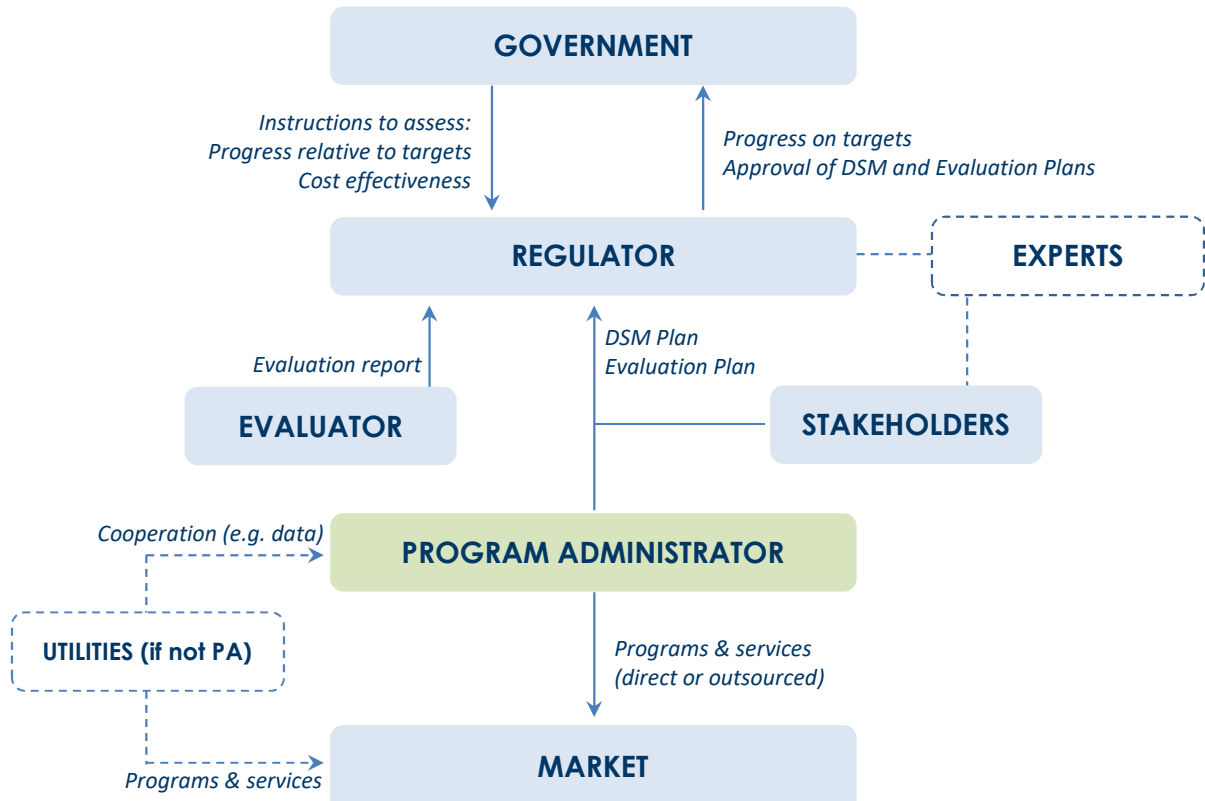


Figure 1: Overview of Generic Oversight Model

Other key players also include:

- Stakeholders**
 From civil society to large corporations, stakeholders have a key role in the development and approval of DSM Plans and the oversight process. The level of engagement—and the time at which these stakeholders are consulted within the proceedings—can make the difference between a collaborative and an adversarial oversight process.
- External experts**
 Beyond the evaluators retained to conduct the formal evaluation, the Regulator, stakeholders or program administrator may also retain the services of external experts to offer guidance on the evaluation of DSM programs, as further guidance or redundancy (a second, or rather third, pair of eyes).

In all cases, some critical success factors include a **clearly established oversight process** (to help all players prepare adequately), **transparent stakeholder engagement** (to build well-designed programs, and minimize strife), as well as **independent and credible evaluation** (to provide confidence in the results reported by the program administrator).

There are significant nuances to these elements. In the following sections, we briefly outline some differences in oversight models in other jurisdictions, and then turn our eyes to Alberta.

OVERSIGHT MODEL: INSIGHTS FROM OTHER JURISDICTIONS

While similar actors are present in most jurisdictions, the exact oversight process—and degree of external oversight—can vary significantly. In the table below, we provide an example of some key differences:

Table 1: Oversight Model Characteristics in North America: *Impact Evaluations*

JURISDICTION	TYPE OF EVALUATOR	WHO HIRES/OVERSEES EVALUATOR	EVALUATOR REPORT PUBLIC?	ANNUAL REVIEW BY REGULATOR?	DEGREE OF EXTERNAL OVERSIGHT
California	External	Regulator	Yes	Yes + evaluation expert	Strong
Nova Scotia	External	PA	Yes	Yes + evaluation expert	Strong
Ontario (gas)	External	Regulator	Yes	Yes	Strong
Massachusetts	External	PA + stakeholder group	Yes	Yes	Strong
BC Hydro	Internal, with ext. oversight	PA + stakeholders	Yes (summary)	Yes	Basic
Maine, Quebec, FortisBC electric	External	PA	Yes	Yes	Basic

We highlight the following elements:

- **There is a clear reporting and approval procedure:** by virtue of its mandate to oversee progress against set targets, the Regulator typically approves DSM and Evaluation Plans, and reviews progress on a regular basis, including formal evaluation reports but also progress reports drafted by the PA. In some cases, the Regulator may retain the services of external experts to provide guidance on plans and evaluation reports, effectively evaluating the evaluator.
- **Evaluation reports are public:** an open, transparent process is essential to fostering confidence in the reported performance of the PA (and to keeping a bit of pressure on the program administrator). In some jurisdictions such as British Columbia, only a summary (typically prepared by the PA) is made readily available.
- **Evaluators are external (or closely overseen by external experts):** to ensure the credibility of the evaluation reports, programs should be evaluated in an impartial way, hence the need of external evaluators. In the unique case of British Columbia, the evaluation is conducted by the utility's internal evaluation division, but under the oversight of external experts through an oversight committee.
- **The responsibility to hire evaluators is clearly assigned:** in most cases, the requirement that an evaluation be conducted is made by the regulator, but the actual hiring is conducted by the PA. In some cases (MA, others), stakeholders play a role in writing the RFP, selecting the contractor and overseeing the study. In others (CA, ON), the regulator makes the call—a way to ensure further external oversight. In all cases, the responsibility is explicitly assigned.

These different approaches lead to varying degrees of external oversight. We note that a clear, public process with strong external oversight produces more reliable results and fosters buy-in in the stakeholder community.

OVERSIGHT MODEL: KEY CONSIDERATIONS FOR ALBERTA

In establishing its oversight model, Alberta faces a set of unique challenges:

- **Building a robust foundation with stakeholders:** energy efficiency programming and oversight remain largely new in the province, including from the perspective of the regulator, the Alberta Utilities Commission (AUC), and the various utilities and stakeholders. While there is room to adjust and correct over time, setting up a clear process from the start—with targets and a collaborative role for stakeholders, evaluators, and experts—can help ensure a smooth start to Energy Efficiency Alberta’s activities.
- **Enforcing budgetary and planning discipline from the start:** Energy Efficiency Alberta, the program administrator, was granted a substantial budget in a short timeframe, clearly emphasizing the need for rigorous oversight to ensure the good administration of carbon levy funds.
- **Adjusting processes to the unique Alberta context:** program managers will face the challenge of tailoring their energy efficiency programs to the unique Alberta context—its dynamic electricity market, its ambitious climate targets, its diversified customer base. A strong oversight process, with its rigorous engagement of stakeholders and professional evaluators, can play a highly constructive role in this iterative optimization.

Building on this context, we offer a set of considerations for Alberta as it designs its oversight process:

PLANNING & REPORTING

• *Set clear targets*

A first step in overseeing the performance of Energy Efficiency Alberta or any energy efficiency PA is to set clear targets. This requires defining:

- **The nature of the targets:** while most energy efficiency PAs are evaluated against energy savings, GHG emission reductions represent an innovative (and emerging) way to guide program design, and to align efforts with the government’s overall climate goals.
- **The structure and level of the targets:** the timeframe and level associated with targets need to be explicit, as they will guide the design of the DSM Plan.

We explore targets and KPIs in more detail in the next section.

• *Set clear reporting (and approval?) procedures*

A successful oversight process includes clear reporting procedures, whereby the PA is given an opportunity to answer questions from stakeholders in a formal, light-shining process (typically, a regulatory hearing such as that of the AUC). This includes reporting on progress against set targets and submitting evaluation reports; it may also include the explicit requirement that the PA obtain Regulator approval for its DSM Plan and Evaluation Plan before moving ahead.

In all cases, this process is public, and clearly outlined from the start, such that the PA is well aware that, on a regular basis, they will be called to testify on their activities and face their stakeholders.

- *Planning cycles have an impact on PA operations*

Preparing DSM Plans requires considerable resources, notably in terms of characterizing and forecasting the markets over a given period of time. While a very short planning cycle can bog down operations by forcing the PA into a constant planning mode, a very long planning cycle can also strain operations as PA staff spend considerable effort seeking to forecast the future and releasing regular updates.

As illustrated in the table below, most jurisdictions have found their rhythm with DSM Plans covering around 3 to 6 years, with annual progress reports to the regulator and periodic evaluations—a model that Alberta could replicate. Note the exception of Manitoba Hydro, which prepares a 3-year plan for approval, but also prepares a 15-year outlook to support its integrated resource planning (IRP) cycle.

Table 2: DSM Planning Cycle in Select Jurisdictions

JURISDICTION	DSM PLAN COVERAGE (yrs)
BC	1-3*
NS	3
QC	3
NB	3
CA	3
VT	3
ME	3
ON	3-6
MB	3-15

* Based on rate application filings.

- *Stakeholder engagement can take place upstream of regulatory review*

Energy efficiency activities cut across various sectors of the economy, and as a result often generate a long list of stakeholders, from consumer groups to large corporations. As Energy Efficiency Alberta prepares its first plans, it is likely that stakeholders will be increasingly curious about its activities and seek to be involved in some capacity.

In theory, this stakeholder engagement chiefly manifests itself as part of formal regulatory hearings, in the same vein as utility rate application hearings. In practice, in some jurisdictions regulatory hearings over DSM activities have become somewhat adversarial, as stakeholders fight to be heard and to influence proceedings. More successful models seek to integrate stakeholder engagement into the oversight process *upstream* of regulatory proceedings.

Various approaches may apply here, with **varying degrees of formality**. One model sets up a formal Stakeholder Roundtable, whereby a set number of stakeholders make up a committee that is tasked with (a) reviewing the proposed DSM Plan, Evaluation Plan and their assumptions *ahead* of regulatory hearings, in partnership with the PA; (b) offering its recommendations to the Regulator; and (c) participating in the selection of evaluators. Quebec's new energy efficiency crown corporation, *Transition Énergétique Québec*, is heading in this direction according to its enabling legislation. In other cases, select stakeholders may hold a seat on the oversight committee responsible for supervising evaluations, or be consulted informally during the DSM planning process.

In all cases, stakeholders are offered a voice, both *ahead* of and during regulatory proceedings.

- *A note on utilities*

The role of utilities is critical in the delivery of energy efficiency programs, in Alberta and elsewhere: they can support program delivery by providing access to customer data, by offering complementary services, or even by outright delivering programs themselves in response to an RFP put out by the PA (in cases such as Alberta's where the PA is not a utility itself). Conversely, utilities can also be a source of challenges for non-utility PAs. Common challenges for Efficiency Nova Scotia, for instance, include limited access to utility customer data, and competing priorities with the local utility.

In any case, Alberta utilities and Energy Efficiency Alberta will be bound to work together. Given the close nature of this relationship, and the potential for conflicts of interest, the role of utilities in the oversight process (as stakeholders, as observers?) will depend on their role in the delivery of programs in the province—a decision yet to be made.

We explore various program **delivery models** in a separate memo.

EVALUATION

- *Clearly assign the responsibility to hire external evaluators*

It remains best practice to hire external evaluators and to publish evaluation reports online. The responsibility for hiring these evaluators should be clearly assigned (and as we have seen earlier, it may fall on the PA, the Regulator, the stakeholders, or a combination thereof). Note that we caution against opaque internal evaluations, as they can chip away at confidence in the results, especially in a case where utilities need verified results for planning purposes. Alberta utilities will be very keen to read external evaluation reports, to feed into their own IRP processes.

- *Consider the added value of process evaluations*

Evaluations can take two key forms: *impact* evaluations, whereby the results of the programs (energy or emission savings) are verified, or *process* evaluations, whereby the operations of a program are examined. **Impact evaluations** are critical to the proper oversight of progress against set targets, and should be explicitly mandated by the Regulator, with a set timeframe. While not as critical, **process evaluations** also offer significant value by helping assess the inner workings of a program, and offer recommendations for improvement—their integration in the oversight process, in some capacity, should be considered.

- *See evaluation as a means for continuous improvement, not just after-the-fact policing*

Successful PAs see evaluation as an opportunity for improvement and are proactive. Instead of waiting for “judgement” at the end of an evaluation cycle (and be caught like deer in the headlights), these PAs use evaluation techniques to adjust course in an *ongoing fashion*. An example is the use of “rapid-fire” methods (short sample surveys, free-ridership estimates, and so on), which allow to take the pulse of their program early on, and take corrective action where needed.

REGULATORY OVERSIGHT

- *Clearly frame the government's role in the oversight process*

One of the critical success factors for energy efficiency PAs rests in the organization's independence: its ability to act relatively freely in the pursuit of its targets, subject to evaluation. The government has a strong role to play in the oversight of the PA, but it is heavily front-loaded, namely:

- Setting targets;
- Outlining attribution rules (which kWh saved or tonne CO₂e reduced can be claimed by the PA?);
- Offering initial instructions to the Regulator (which targets/KPIs to monitor); and
- Monitoring progress via the Regulator's reports.

Successful oversight models rely on clear guidelines from the start—and then on trusting the process.

- *Beyond the evaluators, external experts can bring additional value (and oversight) to a new process, but...*

The regulator may call upon an external expert to help review evaluation reports, as is done in California and Nova Scotia. Similarly, external experts can be called upon by stakeholders to help provide guidance on DSM Plans, Evaluation Plans, or evaluation reports. While there is considerable value in having experts support the regulatory process—especially in a new case such as Alberta's—we caution against the excessive multiplication of external experts, which can cloud the regulatory process. The use of a common external expert (say by a formal stakeholder committee recognized within the oversight process) can help mitigate these risks.

With a robust and collaborative oversight process in place, the next question becomes: **what metrics are we assessing?** We explore this question in the following pages.

KEY PERFORMANCE INDICATORS (KPIs): AN OVERVIEW

Key performance indicators (KPIs) help assess the performance of the PA against set targets (*you can't manage what you don't measure*). The oversight process discussed in the previous section is largely predicated on tracking and evaluating progress against these indicators.

As an overview, we break KPIs down in two broad categories:

- **Target Performance Indicators (TPIs)**
Metrics used to measure success against pre-defined, quantified targets. These are the critical targets that the Regulator is instructed to focus on.
- **Other Performance Indicators (OPIs)**
Quantifiable metrics that **could** be reported to provide additional insight into the PA's performance, but that are not subject to set targets and mandated oversight.

Each jurisdiction chooses which KPIs fall in which category, based on their overarching goals for the energy efficiency PA. In Figure 2, we outline some common categories, noting that not all of these KPIs are considered by all jurisdictions:

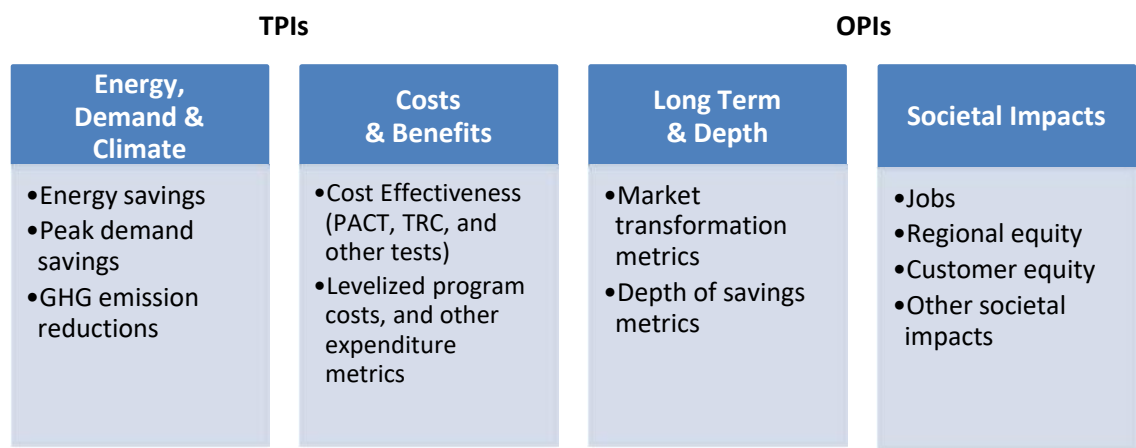


Figure 2: Common Key Performance Indicators

On the next pages, we offer a brief definition of each type of KPI.

ENERGY, DEMAND & CLIMATE

These targets, or a subset thereof, are top of mind for the regulator and government.

Energy savings

These savings, expressed in kWh or GJ (annual, cumulative), represent the amount of energy that would have been expended had it not been for the energy efficiency program. Energy savings require the calculation of net-to-gross ratios, which takes into account free ridership and spillover effects.

Peak demand savings

These savings, expressed in kW peak, represent peak demand capacity that would have been solicited had it not been for the energy efficiency program. Peak demand savings also require the calculation of net-to-gross ratios, which takes into account free ridership and spillover effects.

GHG emission reductions

This metric, expressed in tonnes CO₂ or CO₂e, represents GHG emissions that would have taken place had it not been for the energy efficiency program.

COSTS & BENEFITS

Every jurisdiction defines costs & benefits differently, in a bid to screen DSM programs in or out of the portfolio. Some key concepts include:

Societal or Total Resource benefits / costs

Total Resource Cost (or Benefit) measures the net costs of a DSM program based on the total costs of the program, including both the participants' and the utility's costs. A Societal view considers externalities like pollution or health impacts in addition.

Ratepayer benefits / costs

Ratepayer tests measure the impact to customer bills in response to a DSM program.

Participant benefits / costs

Participant tests measure the benefits and costs to the customer due to participation in a DSM program.

Levelized program cost

An economic assessment of the lifetime cost of saved energy expressed in \$/kWh or \$/kW saved. It is commonly used to compare with supply-side resources.

LONG-TERM & DEPTH

This catch-all category includes a suite of metrics that seek to assess the longevity and depth of energy savings. Some concepts include:

Market transformation

These metrics seek to assess whether lasting change has been enacted on market behaviour, by removing market barriers hindering the adoption of cost-effective energy efficiency measures. Some metrics include market progress indicators such as number of trained service providers, changes in awareness and attitude relative to select measures, and changes in market share of select measures.

Other metrics

Some other metrics include the penetration of residential and commercial weatherization (ME), participation level by sector (VT), and select process metrics such as customer satisfaction (VT, OR, NS) and program implementation efficiency (VT, OR).

SOCIETAL IMPACTS

These KPIs measure the impact of energy efficiency programs on broader social, economic and environmental elements.

Improvement to EE in low-income housing

An assessment of improved energy efficiency in low-income housing, as a proxy for improvement toward poverty alleviation.

Renewable energy generation

The new renewable energy capacity, expressed in nameplate MW, that was installed in response to a given program.

Geographic equity

A measure of the fairness of program outreach, to ensure that a given geographic region is not favoured over another.

(Green collar) Job creation

A measure of the number of jobs created as a result of a given program. The nature of this metric can vary, and include the accounting for direct and indirect jobs, the permanence of the jobs, etc.

Critically, given the importance of KPIs on the PA's activities—from initial cost effectiveness screening to program design—there needs to be a **rigorous process to determine KPIs**. Not only does setting up initial KPIs require close scrutiny, but it can be expected that KPIs may be revisited over the years as part of the regulatory process (for instance, cost effectiveness tests are the regular subject of debate at regulatory hearings).

In the following sections, we briefly outline some KPIs in other jurisdictions, and then outline some considerations for Alberta.

KEY PERFORMANCE INDICATORS: BENCHMARKING

The selection of KPIs depends heavily on local goals and procedures. Table 3 outlines the reported KPIs for select jurisdictions:

Table 3: Reported Key Performance Indicators in North America

KEY PERFORMANCE INDICATORS	VT	ME	DC	MA	HI	OR	OH	CA	NY	WI	NS	ON	MB	Total
ENERGY, DEMAND & CLIMATE														
Energy Savings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
Peak Demand Savings	✓		✓	✓	✓		✓	✓			✓		✓	8
GHG Emission Reductions		✓												1
COSTS & BENEFITS														
Total Expenditure	✓	✓	✓								✓	✓		5
Total Resource Benefits	✓			✓	✓									3
Program Expenditure		✓	✓								✓			3
Levelized Program Costs		✓				✓								2
Net Benefits				✓										1
Total Ratepayer Benefits											✓			1
Participant Cost		✓												1
Benefits to Cost Ratio (TRC & PACT)		✓												1
Lifetime Energy Benefits		✓												1
LONG TERM & DEPTH														
Market Transformation	✓			✓	✓									3
Customer Satisfaction	✓					✓					✓			3
Business Comprehensiveness	✓			✓										2
Program Implementation Efficiency	✓					✓								2
Participation Level by Sector	✓													1
Energy Savings for Largest Users			✓											1
Residential Weatherization		✓												1
Commercial Weatherization		✓												1
SOCIETAL IMPACTS														
Improve EE in Low-Income Housing	✓		✓								✓			3
Renewable Energy Generation			✓			✓								2
Geographic Equity	✓				✓									2
Green Collar Jobs		✓	✓											2
Expenditures with Small Businesses			✓											1
TOTAL	11	11	9	6	5	5	2	2	1	1	7	2	2	

We highlight the following elements:

- **Energy savings remain the most common KPI... but others are emerging:** historically, energy savings (and, to a lesser extent, peak demand savings) have been the key performance indicator of choice (often also expressed as a % of load). The conversation is slowly expanding as more jurisdictions outline state- or province-level climate goals. Maine, for instance, has recently added a long-term GHG emission reduction target to the reporting requirements of its energy efficiency PA, Efficiency Maine.
- **Utility and non-utility PAs may take a different approach:** in many jurisdictions, energy efficiency programs are the responsibility of the local utilities—organizations with a mandate to serve customers in their service area, often expressed in energy terms. Other jurisdictions have set up special-purpose entities (“energy efficiency utilities”), such as Vermont, Nova Scotia, Oregon, and Maine. In these jurisdictions, there has been a trend in expanding the KPI universe and consider broader societal impact. Beyond Maine’s GHG emission reduction target, some other KPIs include renewable energy generation (OR), geographic equity, job creation, market transformation, and many more. In total, 7 out of the 13 jurisdictions examined above report Long-Term, Depth of Savings, or Societal Impact KPIs.
- **Different jurisdictions use different metrics for similar concepts:** there are several different ways to express certain KPIs, especially in the case of costs & benefits. Some jurisdictions favour a certain cost-effectiveness test, or may require levelized costs expressed with a specific equation.

In the end, a clear KPI framework is required so that the PA knows the rules by which it will be assessed.

KEY PERFORMANCE INDICATORS: KEY CONSIDERATIONS FOR ALBERTA

In establishing its KPI framework, Alberta faces challenges and opportunities:

- **(Challenge) Achieving buy-in on the nature, structure and level of KPIs:** the decision to choose between energy savings and GHG emission reductions as target performance indicator is critical, and is likely to generate debate. The structure of these targets (timeframe) and levels may also be contentious.
- **(Opportunity) Sending a clear signal:** jurisdictions set targets for what they care about. Alberta has an opportunity to clearly signal its priorities and timeframe, not only to Energy Efficiency Alberta but to the broader stakeholder community.

Building on this context, we offer a set of considerations for Alberta as it designs its oversight process:

KPI FRAMEWORK

- *Confirm that the overarching target is GHG emission reductions, not energy savings*

Requiring Energy Efficiency Alberta to focus on saving energy would not produce the same programs and results as a focus on GHG emission reductions would. The current direction seems to suggest that GHG emission reductions will be selected as the key target. This would represent an innovative approach, and position Alberta at the forefront of energy efficiency-based climate action (no other jurisdiction focuses solely on GHG emissions in its energy efficiency framework).

- *Determine the value and/or need for electricity-specific targets to inform resource planning*

Depending on Alberta's electricity resource planning process, there may be considerable value in integrating electricity-specific savings assumptions into load forecasts. If this is the case, Alberta will want to consider setting clear targets and/or forecasts, insofar as they can be used to avoid over-investment in electricity supply resources to meet Alberta's power needs.

- *Determine the cost-effectiveness framework, if any, and clearly think through the implications*

The cost effectiveness framework will help screen programs and pilots before their launch (as plans are approved), and assess their performance over time. The energy efficiency industry uses a suite of cost effectiveness tests, some of which have been shown to misrepresent both costs and benefits if not applied properly or without significant investment. Furthermore, with a GHG-focused process, there may be value in considering replacing cost-effectiveness metrics with cost-efficiency ones.

If cost-effectiveness metrics are retained, Alberta should choose between the broad Societal Cost Test (SCT), and a narrower but easier to assess Program Administrator Cost (PAC) test. In both cases, careful consideration should be given to assumptions regarding the **cost of carbon** (market or societal value) as well as appropriate **discount rates** (a societal rate, rather than the weighted average cost of capital (WACC), may be more appropriate in this context).

In any case, a **thoughtful, rigorous process** will be required to determine this cost-effectiveness framework and consider its implications.

- *Consider other KPIs to track performance*

We would also suggest keeping track of other KPIs, in line with the stated goals of the province's energy efficiency efforts, namely renewable energy generation (e.g. installed capacity, MW) and job creation (e.g. in line with the approach taken in Maine).

- *Set up a rigorous process to formally determine KPIs*

Beyond this brief discussion, there is a need for a **rigorous process** to determine KPIs and achieve buy-in. The issuance of a white paper with key proposals, followed by a consultation period and expert input, may help firm up the relevant KPIs and their levels. As part of the oversight process, the final KPI framework should be approved by the Regulator or the government, and made available online.

KPI LEVEL

- *There are considerable low-hanging fruit, but be mindful of ramp-up time*

In a relatively new energy efficiency market such as Alberta, there is room to achieve substantial savings or emission reductions. Leading PAs in North America achieve between 1.5 and 2.0% of incremental load reduction *per year* (along with associated GHG emission reductions), some of them despite being leaders in the EE space for decades.

That said, Energy Efficiency Alberta is a brand new organization. Targets should take into account the inevitable ramp-up period required as the crown corporation is set up, and as its program offering is expanded. This may depend on the delivery model, the nature of the programs, the flexibility in staffing, and a suite of other factors.

- *Consider interim targets, and conduct the requisite research*

At the request of ATCO Group, an initial, bottom-up, natural gas “potential study” was completed in 2015. This study identified the cost-effective and achievable natural gas savings that could be generated from reasonably aggressive energy efficiency programs, as well as associated costs, savings and GHG emissions reductions, over an initial six-year period. A separate, very high-level electricity “potential assessment” was also conducted, though only with the intention of providing indicative numbers.

Alberta may wish to consider using the results of that work to establish interim natural gas targets. It can also set interim electricity savings targets, while launching a more fulsome study of the potential for cost-effective and achievable electricity savings. A similar study can assess the potential for distributed renewables. The results of these studies could then feed a set of final targets for all fuels. If this is the case, we recommend establishing a clear timetable for delivery of the studies as well as target-setting.

NEXT STEPS: LAYING THE GROUND WORK

At this stage we suggest that Alberta consider the following next steps:

1. Lay the ground work for the oversight process

- Set clear reporting, approval, and evaluation procedures
- Issue guidelines on the role for stakeholders and external experts
- Assign the responsibility for hiring the evaluators
- Clearly delineate the role for government (powers and limitations)

2. Initiate an open process to determine and formalize targets and KPIs

- Confirm that the overarching target is GHG emission reductions, not energy savings
- Set interim targets, conduct necessary research and set a final timetable
- Set final target levels, including policies to address complexities and tradeoffs if any
- Design the cost-effectiveness framework, if applicable
- Identify other KPIs to be tracked

Given the tight timelines, these steps should be taken in the short term to ensure that the oversight process and KPI framework are established from the onset.

A Review of Policy Rationales for Independent Energy Efficiency Administration

A report to the Alberta's Energy Efficiency Advisory Panel

Brendan Haley, PhD¹

September 22nd, 2016

There is now significant experience, and growing interest, in the administration of energy efficiency programs and strategies through organizations that are independent from both government departments and electric utilities. Examples of independent administrators include the Oregon Energy Trust, Efficiency Vermont, the New York State Energy Research and Development Authority, the Norwegian National Energy Agency (ENOVA), and the Germany Energy Agency (DENA). In Canada, Nova Scotia created a third-party model, and policymakers have expressed an interest in creating independent agencies in Manitoba and Ontario.

In Alberta, The Climate Leadership Report to the Minister of Environment and Parks recommended consideration of an *Energy Efficiency Alberta* entity similar to the models in Nova Scotia and Vermont, and Energy Efficiency Alberta Act received assent in June 2016.

This briefing document reviews the reasons for choosing an independent energy efficiency administrator for Alberta's Energy Efficiency Advisory Panel. In addition, it reviews some of the challenges associated with independent models, and offers some reflections on energy efficiency administration in Alberta's context.

1) Why Choose an Independent Administrator?

Independent administration models have evolved in reaction to the deficiencies discovered in the alternative models of either utility administrator or administration within a government department. Reviews of efficiency administration do not find that there is an ideal model. Much depends on jurisdictional context, and the actual policy process used to arrive at an administration model (Harrington and Murray 2003; Blumstein, Goldman, and Barbose 2005).

Drawbacks to Utility and Government Administration

In North America, energy efficiency programs are typically funded through utility rates. The policy rationale for this funding mechanism is that energy efficiency acts as a system *resource* because it helps avoid supply-side energy system costs (e.g. building new power plants, fuel costs, transmission costs) (see Crossley 2014). Under this policy regime, electric or natural gas utilities are natural candidates to run these "demand side management" programs because they deliver all other types of utility service. In addition, utilities are regulated by commissions or review boards, and have existing relationships with

¹ Brendan Haley is currently a Banting Post-Doctoral Fellow at Dalhousie Universities School of Resource and Environmental Studies. He holds a PhD in Public Policy where his research focused on Canadian low-carbon transitions. He has written and taught on energy efficiency policy issues. He played an key role in the creation of Efficiency Nova Scotia, Canada's first energy efficiency utility.

customers. Jurisdictions that have deregulated have instituted “system benefit charges” to continue to fund efficiency programs.

However, utilities can face disincentives to effectively deliver efficiency programs because efficiency is not like other system resources. Efficiency will reduce utility sales and revenues. Utilities are also incented to increase capital investments under rate-of-return regulation (Averch and Johnson 1962). There are various proposals to eliminate or reduce these disincentives by creating mechanisms for revenue recovery and rewards for energy savings performance (Jensen 2007; Lazar, Weston, and Shirley 2011). However, compensating the utility for lost revenues and providing performance incentives can become expensive for ratepayers and decrease the cost effectiveness of efficiency programming. Moving towards non-utility administration removes the concern about disincentives created through utility administration.

Another option is to administer energy efficiency programs and strategies through a government department. Examples include the Canada’s Office of Energy Efficiency under Natural Resources Canada; the Office of Energy Efficiency in Prince Edward Island; as well as Conserve Nova Scotia, which acted as a Special Operating Agency under the Ministry of Energy. Unstable budgets and political interference are two major reasons why jurisdictions have moved away from government administered models.

Energy efficiency programs are prone to “budget raids”, with cases of legislatures seeking to divert or “borrow” funds towards other policy areas or to alleviate budgetary shortfalls (Kushler 2004). One way to protect budgets is to keep them at arm’s length of legislatures, to remove them from annual budgetary provisions, and/or to have budgets delivered through regulators.

Government administration can also lead to political interference or excessive politicization of energy efficiency programs. In Nova Scotia a Progressive Conservative government created a new efficiency agency and appointed the Premier’s former Chief of Staff as CEO. This appointment created immediate controversy, public criticism, and did not help forge an efficiency policy consensus across political parties.

There are a variety of different third party models. Vermont and Nova Scotia operate as franchises, run by non-profit corporations. Oregon is a sole-purpose, not for profit organization created by the public utility commission. New York has a public benefit corporation. Norway’s Energy Agency is a public enterprise with a dedicated energy fund supported by a grid levy and government funding. Discussing the nuances between these models is beyond the scope of this paper. The paper will focus on discussing the reasons a jurisdiction might consider an independent model.

Rationales for Independent Administration

The following section presents key reasons why jurisdictions consider independent models.

Strong Mission Alignment

A separate organization can develop a mission aligned to energy efficiency and sustainable energy objectives. A dedicated organization avoids potential disincentives or conflicts of interest with other areas of business. The creation of a unique culture is also a reason to create a mission-oriented organization with a clear public purpose objective. This can play an important role in attracting motivated and talent employees, who would not otherwise work in a utility or government setting.

Political Independence

Energy efficiency is a long-term objective. With consistent, sustained effort, efficiency savings accumulate to substantially reduce financial, environmental, and social costs. Shorter term political priorities can throw an efficiency organization off track and off mission. A lack of structural independence can also lead to budget uncertainty which will prevent the administrator from sending the right signals to contractors, trade allies, and customers. There are multiple benefits to removing energy efficiency funds from the annual budget cycle and avoiding boom and bust funding cycles.²

To support policy sustainability, it is also important that the efficiency administrator is recognized as being independent from any one political party and transparent to the public. A level of administrative independence will allow the organization to develop trusting and supportive relationships with multiple constituencies, and be viewed as an independent and unbiased source of energy efficiency expertise when interacting with stakeholders and legislators.

Economies of Scale

A province-wide administrator can take advantage of economies of scale in administrative costs, implementation costs, and branding, while offering customers a single point of contact to access multiple efficiency services. The efficiency agency must elicit support from citizens, which makes branding and marketing a critical function. Common branding and marketing can increase “spillovers” that arise from program participants providing word of mouth endorsements, and increases the pace of market transformation. One of the reasons Vermont opted for an independent model was because of a lack of coherence across its numerous small electric utilities (Nichols, Sommer, and Steinhurst 2007).

Accountability for Performance

Many jurisdictions have opted for an independent model to place greater emphasis on accountability for performance rather than process accountability. Efficiency policy objectives can be clearly represented by short and long term energy savings targets, which can be evaluated, measured, and verified (see section 3 for further discussion on objectives). It is thus possible to make administrators accountable for results, while giving the administrator flexibility to achieve those results through various program strategies.

It is worthy to note that some jurisdictions have opted by multi-criteria performance goals. For instance, Vermont includes targets for short-term “resource acquisition” savings; longer term “market transformation” impacts; as well as a series of equity goals, which include a minimum budget for low-income programs, and targets for total resource benefits in geographic regions and different customer segments. Thus, performance objectives could be tailored to the Alberta Climate Leadership Panel’s call for actively targeting low-income and aboriginal communities (Leach et al. 2015, 74–75), as well as climate policy related objectives.

Flexibility

Energy efficiency strategies need to be able to shift in light of changing technological and market circumstances. For instance, the significant improvements in Light-Emitting Diode technologies have made administrators move away from promoting compact fluorescent lights, and advances in heat pump technology have changed fuel choice and fuel switching program strategies. Actual program

² Canada has witnessed the influence of budget and program uncertainty on the federal EnerGuide/EcoEnergy program. Escaping from boom/bust budget cycles is one of the reasons the Oregon Energy Trust was created.

implementation also requires a high degree of iterative learning and the ability to make mid-course corrections within programs and between programs. This more dynamic program implementation strategy helps program administrators achieve higher level energy savings targets within a defined budget. Thus flexibility is a necessary complement to accountability for results. A substantial benefit of an independent structure is that it can be removed from standard government contracting procedures and oversight protocols that could slow program delivery, marketing, and communication.

Cross-Fuel and Technology Initiatives

Standard demand side management programs overseen by utility regulators tend to be functionally separated by fuel type as they are delivered by either an electric or natural gas utility and are part of an energy system specific regulatory regime. However, a customer seeking to improve energy efficiency wishes to receive an unbiased service regardless of the type of fuel they might use for different energy amenities. An independent administrator can provide multi-fuel services and a single point of contact for a customer. It can do this while receiving funding from various sources, which might provide efficiency funds based on differing policy rationales. For instance, the Oregon Energy Trust administers both electricity and natural gas efficiency programs from two system benefit charges. Efficiency Nova Scotia provides multi-fuel services, yet has different funds for electric demand side management funded through ratepayers and non-electric fuels (mostly fuel oil for heat) funded through a contract with the provincial government.

2) Challenges and Caveats

If a jurisdiction opts for an independent model, there are challenges that should be recognized and taken into account in administrative design.

Start-up

Creating an independent organization requires extra start-up efforts. Achieving the desired level of independence can require an organization to do extra work in establishing by-laws, lines of credit, office space, data management systems etc.

Any organization must also have access to energy related expertise, and in many jurisdictions this expertise resides within the utility sector or the civil service. Talent attraction and training is a very important issue that must be considered.

Nova Scotia's experience is instructive. There were political delays in the implementation of the enabling legislation. The original stakeholder agreement foresaw a transfer from utility to third-party administration by June 2009 (Wheeler 2008). However, the Act to create the corporation did not receive royal assent until November of that year and Efficiency Nova Scotia first full year of operations was in 2011. Yet, the organization aggressively ramped up towards achieving 1.5% annual incremental electricity savings in 2012, 2013 and 2014. Efficiency Nova Scotia was able to attract experienced personnel from the utility and governmental sectors, and a cadre of highly motivated recent graduates from environment and energy related university and community college programs.

Utility Cooperation

While independent administration removes energy utilities from program delivery, the utilities have resources that are important for effective energy efficiency implementation. Data on customers and

energy systems should be shared with efficiency program administrators. Cooperation with the utility is also important to enable on-bill financing and certain marketing initiatives. The relationship between electric utilities and efficiency administrators might become even more important as energy transitions unfold. Demand response programs can help integrate variable renewable energy generation into the grid, and geo-targeted efficiency initiatives could alleviate transmission constraints.

Nova Scotia has written in legislation that the generation utility must provide the efficiency administrator with information in its possession or control, including “records and personal information, respecting customer electricity usage and load” (Public Utilities Act, 79K(1))

3) Alberta Considerations

Alberta is unique in its potential to fund efficiency services through carbon pricing revenues rather than through electric system revenues or a system benefit charge. This funding mechanism has potential to emulate some of the strengths of the standard demand side management model by providing dedicated funding, and it avoids some of the utility disincentive issues that have made other jurisdictions opt for an independent model. All the policy rationales for independent administration discussed above still apply to Alberta. The province has the opportunity to emulate some of the strengths of the standard demand side management model, avoid the pitfalls associated with government administration, and foster unique energy efficiency strategies that align with carbon reduction objectives.

An independent model could enable an organization **collecting funds from sources additional to carbon pricing revenues**, in a manner similar to how other jurisdictions use multiple funding sources to deliver one-stop-shop efficiency services. Diversified sources of funding on the horizon could include revenues from carbon markets, federal initiatives, social impact investments, and electric system benefit funds.

A benefit of demand side management programs that treat energy efficiency as a resource is that it provides a **clear policy rationale and methodology for determining budgets and savings targets**. The most successful jurisdictions in North America are achieving electric energy savings consistent with 2.5% of annual load (Neme and Grevatt 2016) with a policy commitment to targeting all cost-effective energy savings.³ If Alberta opts for an independent model that seeks to ensure rigorous performance accountability, it might supplement this with a rigorous, consistent, and evidence-based process to determine the role that energy efficiency can play in reducing costs to the energy system in order to determine appropriate savings goals and budget levels.

A benefit of independent administration coupled with carbon revenue funding sources is that efficiency strategies can be designed to **target the multiple benefits of energy efficiency**. While Demand Side Management programs target “system benefits” there are also a number of societal benefits (e.g. GHG reductions, increased employment, energy security) and electricity customer benefits (e.g. energy poverty reductions, increased comfort, employee productivity) (see IEA 2014) that are not often considered by utility commissions.

³ Alberta’s Energy Efficiency Advisory Panel quoted an ATCO Gas submission that suggested annual efficiency investments of 2% of total revenue for electricity, or \$30/person for electricity and natural gas (Leach et al. 2015, 75). These savings targets would likely restrict energy efficiency to a level well below its cost-effective potential. Jurisdictions with a commitment to procuring energy efficiency that is cheaper than supply have budgets in the range of 3-6% of electric utility revenues, and natural gas spending of \$50-\$100/person (Gilleo et al. 2015)

Standard demand side management programs can tend to focus on “resource acquisition” objectives, such as 1-3 year energy savings targets. However, **energy efficiency policies with clearer climate objectives might seek longer-term structural changes**, more consistent with “market transformation” (see Blumstein, Goldstone, and Lutzenhiser 2000), or even more fundamental changes to building structures and energy use behaviours (Torrie 2015). A more climate oriented efficiency policy agenda likely requires an administrator capable of engaging in longer term relationships with partners and financiers. Alberta might then consider a form of independent administration that offers long-term stability, while still ensuring accountability. Vermont transitioned from a 3-year contract model to a franchise model to enable longer-term initiatives (Hamilton 2008). Efficiency Nova Scotia’s franchise model allows for organizational capabilities to stay with the franchise, while ensuring competition for renewal amongst the franchise holders.

Given Alberta’s deregulated electricity market with numerous retail providers, a province-wide agency could provide a consistent brand and economies of scale. However, a form of **province-wide administration does not preclude more localized and competitive sub-structures**. Many administrative models such as those in Oregon, Nova Scotia, and Norway encourage competition amongst contractors and the growth of a private sector energy efficiency industry.

Alberta policymakers should also be aware of potential trends in energy efficiency. One vision is to empower private finance and private sector delivery of energy efficiency projects by developing common energy savings standards and protocols (Golden 2015; European Commission 2016). Big data computational capabilities and smart meter infrastructures could make this vision a reality. However, developing the right rules and creating private sector confidence in a “negawatt” will require policy learning. Efficiency Alberta could help explore the potential to build such a market for efficiency.

4) Conclusion

An independent administrative model could provide substantial benefits to Alberta, despite the province developing its efficiency program from a policy history that differs substantially from jurisdictions with more experience with utility system demand side management programs. Alberta has the opportunity to emulate the advantages of more standard demand side management programs, and enhance them given the unique policy objectives associated with funding efficiency through carbon pricing revenues.

The reason for choosing an administrative model in Alberta include mission alignment, political independence, economies of scale, and flexibility. The model will enable cross-fuel and technology initiatives, as well as a regulatory system that ensures accountability for performance. The challenges involved in starting up the organization and ensuring cooperation with other utility system players should not be underestimated.

Finally, the formal administrative structure is only one aspect of creating a high-performing organization. Developing the administrative structure should be a jumping off point towards the critical tasks of attracting talented and motivated people, creating the right organizational culture, and developing public confidence.

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ALBERTA ENERGY EFFICIENCY PROGRAM DESIGN **PROGRAM OPTIONS**

PREPARED BY:
DUNSKY ENERGY CONSULTING

Submitted to the Alberta Climate Change Office



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INTRODUCTION

PURPOSE OF THIS REPORT

Alberta's Climate Change Office (ACCO) has been tasked with creating Energy Efficiency Alberta, a new agency responsible for promoting and supporting energy efficiency and community energy systems across the province. To support this effort, ACCO retained Dunsky Energy Consulting (Dunsky) to design an initial suite of program offerings for the new agency to launch in early 2017. These program offerings are to be selected among a broader range of options, including:

- **Residential:** opportunities for single-family and multi-family buildings, existing and new construction, lighting and appliances, and behavioural options;
- **Business, Not-for-Profit, and Institutional:** opportunities for small facilities as well as medium and large facilities; and
- **Cross-Sectoral:** opportunities for Indigenous communities, community energy, and transportation.

This report provides the highlights of Phase 1 of Dunsky's work, in which we have developed a preliminary, high-level list of energy efficiency and renewable energy program options to address those opportunities. For each option, this report provides a high-level overview of potential programs. For each program, we have also included the following information in Appendix A:

- An indication of the time required to launch the program successfully;
- Ranges of estimated costs and energy savings;
- Potential issues and concerns; and
- An indication of the level of detail included in the above values, given the information available for each.

While all assessments are expected to be firmed up by more detailed research at a later stage, this list of options is designed to inform the ACCO's selection of programs to prioritize in the short-term, while also informing decisions regarding the longer-term, five-year rollout of programs across the province. The intent of this report is not to provide a schedule of programs to be rolled out by Energy Efficiency Alberta. Rather, the intent is to identify the trade-offs that the ACCO will need to make in determining priorities.

NOTES & LIMITATIONS

This report is intended as a high-level exercise to inform broad decision-making rather than detailed program design; additional research will be conducted for programs being designed in Phase 2. As a result, the reader should be aware that specific values may be subject to important limitations:

- **Energy savings** are based on a combination of sources, including primary and secondary research as well as knowledge and experience with other jurisdictions. Actual savings may differ, based on the combination of Alberta's specific end-uses, energy sources, technologies and current practices within each market, market segment and program area.
- **Costs** are based on similar costs in other regions, and may thus differ from actuals in Alberta. In addition, we note that costs across the board will depend on the program delivery infrastructure and oversight framework Alberta puts into place.
- **The transportation sector** offers a broad array of GHG reduction opportunities. Opportunities for transportation programs are a significant component of reducing GHGs, but they are also numerous and require different analyses than other energy efficiency programs. Because of the analysis required to address this sector specifically, we did not address individual transportation programs in this report. Transportation sector values therefore reflect an approximate average of a broad array of specific efforts that could be addressed separately.

Despite these limitations, we believe this analysis can provide a useful starting point – when combined with the consultations underway by the Energy Efficiency Panel – to inform the province's priorities and next steps.

PROGRAMS OVERVIEW

This report provides high-level information on different program options that could be administered by Energy Efficiency Alberta. Programs that are shown to meet a number of key evaluation criteria as well as other considerations important for the ACCO are expected to be selected for detailed program design.

CONSIDERATIONS IN PROGRAM OVERVIEWS

Each program overview is constructed in the same way to allow for easy review and comparison. Aside from the details provided for each option, the table in Appendix A outlines the target markets, estimated costs, and energy savings for all programs, as well as speed of launch.

While most inclusions in the program overviews are self-explanatory, the following clarifications may assist in understanding the results:

- **Costs:** Costs are either provided as a range (for programs with less detailed inputs) or as a maximum budget. We have included them in this way to demonstrate the maximum potential that can be addressed based on our research. However, fewer dollars can be budgeted for each program to provide a greater number and breadth of programs. We anticipate this will be part of the discussions surrounding the selection of the initial 2017 programs.
- **Ramp-Up Periods:** To demonstrate the longer-term potential of programs, we have included both Year 1 and 5-year costs. 5-year costs are **the total costs over five years**, not the costs to run a program in year 5. It is important to note, however, that 5-year costs are not simply a multiple of Year 1 costs. We have taken into account a ramp-up period for each program. Some examples of factors that affect ramp-up periods include program complexity and staffing requirements, consumer awareness, and time for knowledge and capacity to be developed (i.e., for home energy auditors to be trained and licensed). Therefore, the five-year costs will, in some cases, be significantly higher than five times the first-year costs.
- **Level of Detail:** “Level of detail” refers to the level of information and detail included in the preliminary numbers. While program numbers have been developed using our existing research, extensive experience in other jurisdictions, and Alberta-specific data (where possible), some programs would benefit from the more detailed research we will conduct in Phase 2. The level of detail rating indicates the level to which the final program numbers for the selected program options could change based on our Phase 2 work.

RESIDENTIAL SECTOR

Programs in the Residential sector address single-family, multi-family, tenant, and owner-occupied options. Some programs (such as multi-family) can be administered within commercial programs because larger apartment buildings are owned and managed within that sector. In this report, however, we have organized the programs according to the occupancy type. Developing the most appropriate administration function within Alberta's context will become part of our Phase 2 work.

PROGRAM	OVERVIEW
HOME ENERGY ASSESSMENTS/EVALUATIONS	<p>Heating makes up half the energy bill in most homes, making it the single largest energy use for Residential customers. Improving a home's building envelope can save money by using less energy. It can also result in improved comfort and health. Residential homeowners often need assistance to understand the current efficiency of their home, the upgrades that will result in the "best bang for their buck" and how to overcome the upfront cost of those upgrades.</p> <p>A home energy assessment provides an evaluation of a home's efficiency, a tailored report that includes a prioritized list of energy efficient measures, and an initial Natural Resources Canada (NRCAN) EnerGuide rating, which is an official record of a home's energy performance. After the measures have been installed, homeowners receive a final EnerGuide rating and label and, based on the rating, receive applicable rebates to offset the cost of purchase and installation of eligible measures.</p>
LOW INCOME SINGLE FAMILY	<p>Low Income Cut-off (LICO) is one low-income line used by Statistics Canada as an indicator of the extent to which some Canadians are less well-off than others. The LICOs are income thresholds below which families devote a larger share of their income to food, shelter and clothing than the average family would. In 2014, 6.8% and 7.6% of Alberta residents fell under the LICOs after tax and before tax respectively.</p> <p>Low-income homeowners do not have disposable income or access to traditional financing to invest in energy saving upgrades, so participants who qualify (based on income) receive 100% rebates on eligible measures and receive project management services as well.</p>

NEW HOME CONSTRUCTION	<p>This program is designed to encourage homebuilders and homebuyers to construct energy efficient homes and help overcome barriers to doing so. Qualified energy advisors model the home’s energy efficiency based on building plans and provide customized recommendations to improve its efficiency.</p> <p>Incentives help overcome the barrier of upfront capital and can, in combination with the subsequent rating/certification, be used as a tool for builders to market their homes and drive demand for more efficient building design. By increasing participation in the residential new construction program, the building community is better equipped to tackle changes and facilitate the transition of any future increase in energy performance standards.</p>
MULTI-FAMILY RETROFIT	<p>Making energy efficiency improvements in the multi-family sector is often difficult because of split incentives, which occur when those responsible for paying energy bills (tenants) are not those making the capital investment decisions (landlord, building owner or property manager). However, investments in energy efficiency can benefit building owners by increasing rental yield and lowering vacancy rates while tenants benefit from lower energy costs and improved comfort.</p> <p>Multi-family retrofits can offer landlords and property owners an energy assessment and a customized report identifying a list of recommended upgrades, potential incentives (or access to financing) as well as direct free-of-charge installation of low-cost energy efficient products in both common-space areas and rental/condo units.</p>
RESIDENTIAL HEATING AND COOLING SYSTEMS	<p>Improving a home’s heating system can save homeowners money by lowering energy use. It can also result in improved comfort and health. However, residential homeowners often need assistance to overcome the upfront cost of those upgrades and incentives to install higher efficiency models beyond minimum standards.</p> <p>This program encourages the replacement of inefficient equipment with new energy efficient options, installed by qualified contractors, that will reduce energy consumption.</p>
RESIDENTIAL DIRECT INSTALL	<p>Residential Direct Install provides homeowners and tenants with direct free-of-charge installation of low-cost energy efficient measures. This program is viewed as the first step to getting “in the door”, introducing homeowners to the benefits of energy efficiency. Engaging with residents offers an opportunity to highlight additional opportunities for energy savings and other efficiency programs, driving demand for energy assessments and larger investments and deeper energy efficiency upgrades.</p>

CONSUMER PRODUCTS (RETAILER-BASED REBATES)	<p>Homeowners and tenants have tremendous opportunities to improve the energy efficiency of their dwellings and reduce their utility bills by replacing older, less efficient lighting and appliances with more efficient options.</p> <p>The consumer products program increases consumer awareness of the benefits of purchasing more efficient lighting, appliances and electronics; lowers barriers to purchasing energy efficient appliances by providing rebates (either point-of-sale, online or mail-in) to customers who purchase new energy efficient appliances and electronics; and expands the availability, consumer acceptance, and use of energy efficient technologies.</p>
APPLIANCE RETIREMENT	<p>Refrigerators and freezers are two of the largest energy-consuming appliances in a home, and newer models can cost far less to operate due to better insulation, tighter door seals, and improved compressors and cooling coils.</p> <p>The refrigerator retirement program accelerates the retirement of older, less efficient, but working, refrigerators and freezers by removing them directly from participants' homes at no charge and by providing a cash incentive.</p>
RESIDENTIAL SOLAR PV	<p>Residential Photovoltaic (PV)-generated electricity can help to meet electricity demand and GHG reduction targets by adding renewable energy onto Alberta's grid.</p> <p>Solar programs tend to be very attractive to customers, as they provide a sense of control over electricity supply and costs. They involve incenting the installation of rooftop or ground mount solar panels either through direct rebates or by reducing upfront costs through financing options.</p>
BEHAVIOURAL FEEDBACK – HOME ENERGY REPORTS	<p>Home Energy Reports help households reduce their energy consumption by changing their behaviours.</p> <p>Periodic reports are mailed to participants to illustrate their energy consumption and provide customized energy-efficiency tips and strategies to help them reduce their energy consumption. These reports allow participating households to compare their energy usage with similar homes in their area. Through individualized feedback, prompts and the use of social norms, households are encouraged to reduce their energy consumption in relation to their neighbours who have homes of similar size, age and heating type.</p>

BUSINESS, NOT-FOR-PROFIT, AND INSTITUTIONAL

Programs in the Business, Not-for-Profit, and Institutional (BNI) sector are designed to assist small businesses, non-profits, municipalities, institutions, and medium-to-large businesses reduce their emissions and energy use. Due to the variation in types and energy usage of entities within this sector, programs can be designed for very specific market segments or the sector as a whole. The overviews provided here focus more on sector-level concerns rather than specific program options such as prescriptive rebates vs. custom options. Large emitters are not intended to be eligible for any of these programs and have been excluded from our analysis in terms of energy and emissions reduction potential.

PROGRAM	OVERVIEW
SMALL BNI	<p>Small businesses and other entities, including government and non-profits, face tremendous barriers to improved energy efficiency. Among others, they often:</p> <ul style="list-style-type: none"> • Lack the time and expertise needed to consider options; • Rent their spaces, leading to split incentives; • Are nervous about their long-term survival, leading them to severely discount the value of future savings in their decision-making. <p>Because of this, small business energy efficiency programs commonly focus on simple, hassle-free programs that cover all or the bulk of associated costs, ensuring that changes are cash-flow neutral or positive. Lighting; refrigeration; and heating, ventilation, and air conditioning are common technologies promoted through these types of programs.</p>
MEDIUM AND LARGE BNI	<p>Medium and Large BNI programs differ from those provided for small BNI customers, as Medium and Large commercial owners often stay in their facilities for longer periods of time and are therefore more inclined to make longer-term investments in energy efficiency.</p> <p>This group faces both financial barriers (the payback may be too long for facilities to invest in energy efficiency options over other opportunities) and technical barriers (lack of knowledge about opportunities, actual energy use of specific processes or operations, and calculation of annual savings) to implementing energy efficiency projects.</p> <p>Because of the range of facility types in this customer group, there are often two types of programs:</p> <ul style="list-style-type: none"> • Custom programs that offer projects designed and negotiated on a per-customer basis; and • Prescriptive rebates on measures such as lighting; refrigeration; and heating, ventilation, and air conditioning, as well as specific measures for individual market segments.

CROSS-SECTORAL

Some programs do not easily fit into either a Residential or Business, Not-for-Profit, and Institutional category. To do so would be to artificially constrain them. To highlight the different requirements or multiple considerations of these types of programs, we have included them in this section. However, they can be developed to meet the needs of either sector during the program design phase.

PROGRAM	OVERVIEW
INDIGENOUS	<p>Indigenous communities face significant barriers to improved energy efficiency. Some examples include:</p> <ul style="list-style-type: none"> • The majority of occupants do not directly own their homes (e.g. in Alberta, 81% are Band-owned), resulting in split incentives; • Band councils often lack the expertise needed to consider options; • The median income is lower than the average; • Financing is difficult to access; and • Many communities are in remote areas where access to energy efficiency services and information remains limited. <p>Indigenous energy efficiency programs commonly focus on simple, hassle-free programs that cover all associated costs and that emphasize local partnerships with the community and other levels of government.</p>
COMMUNITY ENERGY: FEED-IN-TARIFF	<p>Community energy projects are often treated as a separate project category in program design because they are somewhat more difficult to realize than standard energy efficiency programs: community interests must first be aligned and a larger number of participants is involved than in other project types.</p> <p>A feed-in tariff (FIT) is a set rate (¢/kWh) paid for electricity generated by specific types of technologies or projects that provides a secure revenue stream, facilitating the economic feasibility of such projects.</p>

PROGRAM	OVERVIEW
TRANSPORTATION	<p>In 2013, emissions from transportation were the second-largest contributor to Alberta’s GHG emissions, representing 17% of overall GHGs, and road transportation makes up the largest proportion of GHG in this sector. Curbing emissions from the transportation sector is essential to meeting Alberta’s greenhouse gas emissions reductions targets.</p> <p>There are multiple opportunities in the transportation sector, including for light vehicles, heavy-duty vehicles, and behavioural-based approaches. However, many successful programs involve complex strategies with extensive education and outreach in addition to incentives in order to promote overall cultural change.</p>
ENABLING STRATEGIES	<p>Enabling Strategies assist in developing and supporting other energy efficiency programs; they do not generally result in energy savings directly. However, they are an important offering by program administrators because they help to create a culture of awareness about energy efficiency. They can include strategies that:</p> <ul style="list-style-type: none"> • Support and enhance energy efficiency programs by increasing participation in the short-term (innovative financing); • Secure program savings with policy and market changes (codes and standards) over the mid-term; and • Offer lasting benefits through market transformation by changing behaviour and adopting energy efficiency market knowledge, services and practices as the standard.

CONCLUSION

There are many program options that Energy Efficiency Alberta can implement, and each one will result in energy savings and help to reduce emissions.

As provided in this report, there are a number of considerations that can impact which programs are selected for further development: the costs and potential savings, the customer groups they target, the length of time it can take to develop and launch them, the complexity of administration, the level of knowledge and capacity required in the province, and many others.

We look forward to the next phase of this project in which we assist the ACCO by designing a select number of energy efficiency programs to be implemented by the new agency, Energy Efficiency Alberta.

APPENDIX A: PROGRAM HIGHLIGHTS

Program	Target Market	Y1 Cost (\$M)	5-yr Cost (\$M)	Electrical Savings (GWh/yr average)	Natural Gas Savings (GJ/yr average)	Level of Detail	Speed of Launch	Potential Risks
Home Energy Assessments/ Evaluations	Residential homeowners	\$6-7	\$150-180	0.6-0.8	307,800-372,500	● (high)	12-18 months	Provincial knowledge and capacity; changes to federal program
Low Income	Low income homeowners	\$8-10	\$158-191	2-2.5	170,000-210,000	● (high)	12-18 months	Provincial knowledge and capacity; complexity; initial uptake may be low
New Home Construction	Residential homeowners	\$4.5-5.5	\$108-175	3-7	146,000-246,000	● (low)	12-18 months	Provincial knowledge and capacity; changes to federal program
Multi-Family Retrofit	Residential owners and tenants	\$1.0-1.2	\$23-28	0.4-1.5	27,000-44,600	● (mid)	6-12 months	Low risk
Residential Heating and Cooling	Residential homeowners	\$5-7	\$118-170	4-7	200,000-285,000	● (mid)	6-9 months	Counter-beneficial results due to later launch of audit program; free-ridership can be an issue
Residential Direct Install	Residential homeowners	\$15-20	\$68-82	7-9	12,000-15,000	● (high)	6-9 months	Low risk
Consumer Products (Retailer-Based Rebates)	Residential owners and tenants	\$10-15	\$180-275	55-91	391,000-563,000	● (mid)	6-12 months	Free-ridership; quicker launch reduces options for working with retailers
Appliance Retirement	Residential homeowners	\$6-8	\$19-27	7-9	n/a	● (mid)	6-12 months	Low risk
Residential Solar PV	Residential homeowners	\$0.08-0.1	\$9-21	7-14	n/a	● (mid)	6-9 months	Free-ridership; targets wealthier individuals
Behavioural Feedback	Residential homeowners	\$1.7-2.5	\$33-48	39-56	550,000-792,000	● (mid)	18-24 months	Lack of control over program delivery; not recommended until other programs in place

Program	Target Market	Y1 Cost (\$M)	5-yr Cost (\$M)	Electrical Savings (GWh/yr average)	Natural Gas Savings (GJ/yr average)	Level of Detail	Speed of Launch	Potential Risks
Small Business, Not-for-Profit, and Institutional	Small BNI customers	\$3-6	\$22-45	13-16	n/a	● (mid)	9-12 months	Depending on model selected, may result in concerns about limited contractor participation
Medium and Large Business, Not-for-Profit, and Institutional	Medium and Large BNI customers (excluding large emitters)	\$32-54	\$567-958	311-528	1,196,000-2,022,000	● (low)	6-12 months	Free-ridership; longer lead times for Custom project results
Indigenous	Indigenous communities	\$1-2	\$7-12	1-2	4,300-7,200	● (low)	9-12 months	Longer ramp-up for collaborative purposes; more complex planning
Community Energy: Feed-in-Tariff	Communities	\$0.2-0.3	\$15-26	8-12 (after the first year)	n/a	● (low)	12-24 months	Low initial uptake; complexity
Transportation	Residential and Commercial	\$4-5	\$395-479	n/a	n/a	● (low)	6-24 months	Most options require culture change, which requires long-term planning and engagement; lack of provincial jurisdiction for some options
Enabling Strategies	All sectors	\$1-5	\$9-22	n/a	n/a	n/a	6-24 months	Does not achieve energy savings or emissions reductions



50 Ste-Catherine St. West, suite 420, Montreal, Quebec, Canada H2X 3V4 | T. 514.504.9030 | F. 514.289.2665 | info@dunsky.com

www.dunsky.com

Appendix I: List of Submissions to the Panel

Organization Submitting	Organization that Produced the Document	Title/Subject
Alberta Council for Environmental Education	The Centre for Global Education	Supporting Climate Leadership in Alberta Schools
Alberta Council for Environmental Education	Alberta Council for Environmental Education	Curriculum for a Sustainable Future: A proposal to increase literacy around environment, energy, and climate change in Alberta students
Not applicable	Not applicable	Residential Feedback
Canada Green Building Council	Canada Green Building Council	Energy Benchmarking, Reporting & Disclosure in Canada: A Guide to a Common Framework
Not applicable	Not applicable	Energy Efficiency
Not applicable	Not applicable	Retrofitting of Existing Homes
Not applicable	University of Alberta, Edmonton Sustainability Scholars and City of Edmonton	Increasing Household Energy Efficiency: Influencing behaviour change
Nexus Power	Nexus Power	Feedback Requested
Nexus Power	Nexus Power	Delivering Utility Savings to our Customers Through Alternative Energy
Not applicable	Not applicable	The Pervasive Influence of Energy
Not applicable	Not applicable	Chapter 9: Which is the Greater Energy Need Thermal or Electrical; A Perspective on Natural Gas
Not applicable	Not applicable	Ideas for Energy Efficiency
GSS Integrated Energy Ltd	GSS Integrated Energy Ltd	Submission to the Panel
Neighbour Power	Neighbour Power	Can Solar FIT in Alberta?
Not applicable	Fraunhofer	The Biobattery
Not applicable	Susteen Technologies	Resources and Energy from Biomass and Plastics Residue
Astravan	Astravan	Submission to the Panel
Astravan	Astravan	Some Examples of Transpired Solar Collectors Supplied by Astravan in the Pacific Northwest
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel

Organization Submitting	Organization that Produced the Document	Title/Subject
Not applicable	Not applicable	Submission to the Panel
North American Insulation Manufacturers Association Canada	North American Insulation Manufacturers Association Canada	Input on Energy Efficiency Alberta
Not applicable	Not applicable	Submission to the Panel
Canadian Coalition for Green Finance	International Renewable Energy Agency	Unlocking Renewable Energy Investment: The Role of Risk Mitigation and Structured Finance
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Alberta Geothermal Energy Association	Alberta Geothermal Energy Association	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
TK Environmental Corp	TK Environmental Corp	Submission to the Panel
Not applicable	Not applicable	Centralized vs Decentralized Green Energy
Optimist Wind Energy	Optimist Wind Energy	Submission to the Panel
Solar Max Power	Solar Max Power	Submission to the Panel
Not applicable	Not applicable	Energy efficiency ideas
Not applicable	Not applicable	Submission to the Panel: EV Subsidies
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Lighthouse Studios Residential Design	Lighthouse Studios Residential Design	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel

Organization Submitting	Organization that Produced the Document	Title/Subject
Not applicable	GreenTechMedia	How the Grid Was Won: three Scenarios for the Distributed Grid in 2030
Mother Teresa Catholic School	Mother Teresa Catholic School	High school create[s] renewable energy
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Sidel Systems	Sidel Systems	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel - Distributed Green Energy Tariff
Not applicable	Not applicable	Submission to the Panel
Solar Optix Energy Services	Solar Optix Energy Services	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Western Asphalt Products	Western Asphalt Products	Review of Cold in Place Recycling
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	My comments about Energy Efficiency Open House
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Energy Efficiency
Not applicable	Not applicable	Energy Efficiency Plans
Not applicable	Not applicable	Energy Efficiency Plans
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel

Organization Submitting	Organization that Produced the Document	Title/Subject
Aspen Centre for Integral Living	Aspen Centre for Integral Living	Submission to the Panel
Not applicable	Not applicable	Suggestions - \$645 million energy panel and budget
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
King Sunshine Solar Systems Inc	King Sunshine Solar Systems Inc	Attn: Dr. David Wheeler
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel re: PACE and LIC programs
Not applicable	Not applicable	Submission to the Panel re: updates to building codes
Not applicable	Not applicable	Energy Efficiency Advisory Panel - Recommendations
Not applicable	Not applicable	My thoughts on energy efficiency in Alberta
Digital Solar Heat	Digital Solar Heat	Overcoming Barriers to Promote Energy Efficiency and Community Energy?: A response to the Alberta Government Call for Input into Energy Efficiency Programs
Reidco Power Corp	Reidco Power Corp	Submission to the Panel
Prairie Management and Realty Inc	Prairie Management and Realty Inc	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Southern Alberta Institute of Technology	Alberta Energy Efficiency Alliance	Input on Energy Efficiency Alberta
Green Calgary Association	Green Calgary Association	Submission to the Panel
MyHeat	MyHeat	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	An Energy Saving Idea
Not applicable	Not applicable	Energy Efficiency Panel Website
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Home Energy Retrofit

Organization Submitting	Organization that Produced the Document	Title/Subject
Not applicable	Not applicable	Renewable Energy
Foundation Energy Infrastructure Inc	Foundation Energy Infrastructure	Community Energy Strategy for Alberta
Not applicable	Not applicable	Submission to the Panel re: SHARP (seniors program) and energy efficiency rebates
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Government of Alberta; Apprenticeship and Industry Training	Photovoltaic Systems
Trina Solar	Trina Solar	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel Solar Energy Aspect
Not applicable	Not applicable	Alberta Auto-Mobile
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Energy Ideas
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Alberta Chapter - Canada Green Building Council	Alberta Chapter - Canada Green Building Council	Input on Energy Efficiency Alberta
Not applicable	Kid Icarus Solar Systems	Project Proposal
Not applicable	Not applicable	Ideas for Energy Efficient Alberta
Not applicable	Not applicable	Hydrogen Plants
Not applicable	Not applicable	Submission to the Panel
Inside Education Society of Alberta	Inside Education Society of Alberta	Energy Efficiency K-12 Education
MyHeat	MyHeat	MyHEAT shows you where energy is escaping from residential, municipal, commercial and industrial buildings. Based on this information it provides visitors with tools to increase building energy efficiency.
Just Energy	Just Energy	Advance Energy Efficiency Programs - Just Energy Input

Organization Submitting	Organization that Produced the Document	Title/Subject
Solar Energy Society of Alberta	Solar Energy Society of Alberta	Alberta's Solar Opportunity
Built Green Canada	Built Green Canada	Leadership in the Residential Building Industry
Built Green Canada	U.S. Dept of Energy	Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections 2014 Edition
Canadian Coalition for Green Finance	Organisation for Economic Co-operation and Development	Green Investment Banks: Scaling Up Private Investment in Low-Carbon, Climate-Resilient Infrastructure
Not applicable	Not applicable	Note to: Alberta Energy Efficiency Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Ajuntament de Barcelona	Urban Mobility Plan of Barcelona PMU 2013-2018
Not applicable	Not applicable	Community-Based Renewable Energy
QUEST	QUEST	QUEST Alberta recommendations for the role of Smart Energy Communities in Alberta's Climate Leadership Plan
Dell Canada Inc	Dell Canada Inc	Dell Feedback on the Alberta Energy Efficiency and Community Discussion Document
Canadian Coalition for Green Finance	Canadian Coalition for Green Finance	Green Bank Alternatives for Policy Makers: A Comparative Analysis
Not applicable	Not applicable	Carbon Reduction
Not applicable	Not applicable	Empowering our students for a green future
Alberta Greenhouse Growers Association	Alberta Greenhouse Growers Association	Submission to the Panel
Decentralised Energy Canada Association	Decentralised Energy Canada Association	Briefing Note for the Microgeneration and Small-Scale Renewables Programs: Technical Session, Edmonton
Not applicable	Not applicable	Energy Efficiency
Clark Ecoscience and Sustainability	MLC & Clark Ecoscience and Sustainability	Solar Energy Production Integration within Urban Residential Developments
Not applicable	Not applicable	Submission to the Energy Efficiency Advisory Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Electric Vehicle Adoption Proposals in Alberta Terms of Reference

Organization Submitting	Organization that Produced the Document	Title/Subject
Not applicable	Not applicable	Building Code Requirement for Electric Vehicles
Not applicable	Not applicable	Electric Vehicle Marketing
Power Take Off	Power Take Off	Feedback for Energy Efficiency and Community Energy in Alberta
Jayman Built	Jayman Built	Submission to the Panel
Not applicable	Not applicable	Home Energy Evaluation and Weatherization
Relight Solutions	Relight Solutions	Relight Solutions' - Submission for Consideration
Advanced Energy Solutions Inc.	Adanced Energy Solutions Inc.	Air Curtains and Greenhouse Gas Emissions: A Presentation to the Energy Efficiency Advisory Panel
Alberta Construction Association	Alberta Construction Association	Submission of the Alberta Construction Association to the Energy Efficiency Advisory Panel
Visions	Visions	Energy Efficiency Programs - Solar
Not applicable	Not applicable	Alberta Auto-Mobile
Federation of Alberta Gas Co-ops Ltd	Federation of Alberta Gas Co-ops Ltd.	Potential Strategies for Working with Alberta's Natural Gas to Promote a Cleaner Future
Alberta Council for Environmental Education	St. Richard Elementary	Energy Efficiency at St. Richard Elementary
Alberta Council for Environmental Education	Innovate Program - Edmonton Public Schools	Innovate High School, Edmonton Public Schools
Alberta Council for Environmental Education	Calgary Board of Education Trustee	CBE's work on sustainability
Community and Co-operative Owned Renewable Energy	Community and Co-operative Owned Renewable Energy	Energy Efficiency Advisory Panel Submission, Sept 21, 2016
Tamas Hydronic Systems Inc	Tamas Hydronic Systems Inc.	Pump System Energy Assessment
Not applicable	Not applicable	Submission to the Panel
Not applicable	Not applicable	Submission to the Panel
Not applicable	Passive House Canada, Alberta Chaper	Energy Saving High Performance Buildings: Input for the Alberta Energy Efficiency Advisory Panel
Not applicable	Not applicable	Canadian Rail-Ferry: The next generation transportation solution for Calgary-Edmonton Corridor

Organization Submitting	Organization that Produced the Document	Title/Subject
Not applicable	Not applicable	Alberta's Climate Plan
Not applicable	Not applicable	Submission to the Panel
Alberta Dark Sky Association	Alberta Dark Sky Association	Cover letter and attachments
Not applicable	Not applicable	Public Input on Energy Efficiency
Not applicable	Not applicable	Funding for NRC-Codes and Envelope Research
Greenpeace Canada	Greenpeace Canada	Solar. A Bright Idea for Alberta.
Canadian Home Builders' Association - Alberta	Canadian Home Builders' Association - Alberta	Harnessing Alberta Entrepreneurial Energy to Encourage Low GHG Communities and Homes
Alberta Council for Environmental Education	Calgary Board of Education	Student Presentation at September 16 panel session
Standens	Standens	Consideration of Environmental Management Systems implemented
EQUUS	EQUUS	Submission to the Panel
Not applicable	Not applicable	Call for input - Energy Efficiency and Community Energy in Alberta
Alberta Community and Co-operative Association; Alberta Co-Operative Energy; Alberta Solar Co-Operative; Federation of Alberta Gas Co-Operative and Momentum	Alberta Community and Co-operative Association; Alberta Co-Operative Energy; Alberta Solar Co-Operative; Federation of Alberta Gas Co-Operative and Momentum	Building Renewable Energy Co-operatives in Alberta
Alberta Hotel and Lodging Association	Alberta Hotel and Lodging Association	Submission to Energy Efficiency Advisory Panel
Alberta Urban Municipalities Association	Alberta Urban Municipalities Association	Alberta Urban Municipalities Association: Submission to the Energy Efficiency Advisory Panel
Starland County	Starland County	Submission to the Energy Efficiency Advisory Panel
Wheatland County and the Rosebud Community Enhancement Society	Wheatland County and the Rosebud Community Enhancement Society	Support for CCOR
Energy Services Association of Canada	Energy Services Association of Canada	Role of Guaranteed Energy Service Performance Contracts (ESPC's) To Achieve Alberta's Energy Efficiency Targets
Ste Anne Natural Gas Co-op	Ste Anne Natural Gas Co-op	Submission to the Panel
Canadian Geothermal Energy Association	Canadian Geothermal Energy Association	Alberta Energy Efficiency Panel Submission; Part 1

Organization Submitting	Organization that Produced the Document	Title/Subject
Alberta Council for Environmental Education	Various	Examples of energy efficiency K-12 education
Clark Ecoscience and Sustainability	MLC & Clark Ecoscience and Sustainability	Solar Energy Production Integration within Urban Residential Developments
SmallGrids	SmallGrids	Energy Efficiency and Community Energy in Alberta: Energy Self-Sufficiency for Small Communities Pilot Project
City of Calgary	City of Calgary	City of Calgary submission to the Alberta Climate Leadership Panel
City of Calgary	Government of Alberta, City of Calgary and City of Edmonton	City Charters Overview Package
Indigena Solutions	Indigena Solutions	Proponent Team Response to RFP 17TDRPOL816
Indigena Solutions, First Light LED and Evergreen LED	Indigena Solutions, First Light LED and Evergreen LED	Indigenous Strategic Economic Improvement Partnership
Genalta Power	Genalta Power	Genalta Power's Submission to the Alberta Energy Efficiency Advisory Panel
Not applicable	Not applicable	Community Supported Bioenergy
Not applicable	Not applicable	Sharing Feedback on Energy Efficiency and Community
Simple Solar	Simple Solar	Solar Energy for Homes: Solar Thermal, Solar Photo-Voltaic
Not applicable	Not applicable	Submission to the Panel
Enervee	Enervee	Input on Energy Efficiency Alberta
BSI Group	BSI Group	Solution Providers: End-to-end, single-source services to support Energy Efficiency Alberta in meeting key objectives
Not applicable	Not applicable	Energy Efficiency Panel Submission
Pembina Insitute	Pembina Institute	Alberta Energy Efficiency Panel Submission
Carbon Trust	Carbon Trust	Energy Efficiency in Alberta: Reflections based on the Carbon Trust's experience in the design, implementation, and evaluation of energy efficiency programmes, September 2016
Pembina Insitute	Pembina Foundation	Capturing the Benefits of Energy Efficiency for Non-Profit Organizations: opportunities, barriers and program recommendations

Organization Submitting	Organization that Produced the Document	Title/Subject
Horizon Housing	Horizon Housing	Submission to the Panel
Decentralised Energy Canada Association	Decentralised Energy Canada Association	Letter of Support for the Community and Co-operative Owned Renewable Energy (CCORE) Program
Decentralised Energy Canada Association	Decentralised Energy Canada Association	Briefing Note for the Microgeneration and Small-Scale Renewables Programs: Technical Session, Edmonton
Decentralised Energy Canada Association	Decentralised Energy Canada Association	Distributed Alternative and Renewable Energy: Developing distributed alternative and renewable energy generation policy
Trec Education	Trec Education	Submission to the Panel
Safe Vehicle Use Limited	Safe Vehicle Use Limited	Improving Motor Fuel Efficiency 5% by Reducing Collisions
Not applicable	Not applicable	Alberta Renewable Energy Incentives
Canadian Wind Energy Association	Canadian Wind Energy Association	Canadian Wind Energy Association Submission to Alberta Energy Efficiency Advisory Panel
EPCOR	EPCOR	Attention: Alberta Energy Efficiency Advisory Panel
Calgary Chamber of Voluntary Organizations	Calgary Chamber of Voluntary Organizations	Alberta's Nonprofit Sector and Climate Change Leadership: Considerations for Relevant and Accessible Programming
Capital Power	Capital Power	Submission to the Panel
Alberta Association of Municipal Districts and Counties	Alberta Association of Municipal Districts and Counties	Energy Efficiency Advisory Panel AAMDC Submission
City of Medicine Hat	Hat Smart	The City of Medicine Hat's Submission to the Energy Efficiency Advisory Panel
Nest Labs	Nest Labs	The Smart Thermostat and its Benefits in Alberta
Utilities Consumer Advocate	Utilities Consumer Advocate	Submission to the Panel
Utilities Consumer Advocate	Utilities Consumer Advocate	Energy Efficiency and Market Policy and Analysis Report
Momentum Community Economic Development Society	Momentum Community Economic Development Society	Submission to the Panel
Alberta Irrigation Projects Association	Alberta Irrigation Projects Association	Subject: Energy Efficiency within the Irrigation Agriculture Sector

Organization Submitting	Organization that Produced the Document	Title/Subject
Peters Energy	Alberta Irrigation Projects Association, Peters Energy	Renewable Energy for Irrigation in Alberta For: Alberta Energy Efficiency Panel
Ecomo.Systems	Ecomi.Systems	Utility-Scale Solar How to partner with coal to eliminate it by 2030
ENMAX	ENMAX	Alberta Energy Efficiency Panel: ENMAX Corporation Submission
Moose Power	Moose Power	Submission to the Energy Efficiency Advisory Panel
Fortis Alberta	FortisAlberta	Submission to the Energy Efficiency Advisory Panel
Not applicable	Not applicable	Submission to the Panel
QUEST	Alberta CHP Working Group	Recommendations to the Alberta Energy Efficiency Panel
Alberta Greenhouse Growers Association	Alberta Greenhouse Growers Association	Submission to Panel
Not applicable	Not applicable	Submission to the Panel
International Association of Heat and Frost Insulators and Allied Workers Local 110 (Alberta)	International Association of Heat and Frost Insulators and Allied Workers Local 110 (Alberta)	Insulating for the Future
Not applicable	Not applicable	Some comments to the Provincial Energy Efficiency Advisory Panel
ATCO	ATCO	Energy Efficiency & Community Energy Systems Consultation
Canadian Gas Association/Canadian Natural Gas Vehicle Alliance	Canadian Gas Association/Canadian Natural Gas Vehicle Alliance	Canadian Natural Gas Vehicle Alliance
Alberta Solar Co-op	Alberta Solar Co-op	Energy Efficiency Advisory Panel Submission
Centre for Social Science	BC-Alberta Social Economy Research Alliance	Alberta Energy Efficiency Panel: Submission from BC-Alberta Social Economy Research Alliance
OPOWER	OPOWER	Citizen Engagement on Energy and Climate Change
OPOWER	Oracle	Unlocking the Potential of Behavioural Energy Efficiency
OPOWER	Oracle & OPOWER	Your guide to getting more out of DSM
OPOWER	OPOWER	Input on Energy Efficiency Alberta

Organization Submitting	Organization that Produced the Document	Title/Subject
OPOWER	AEEA & City of Calgary	Advancing Energy Efficiency in Calgary: Prioritizing Energy Efficiency Program Options
OPOWER	AEEA & City of Calgary	Advancing Energy Efficiency in Calgary: Energy Savings Through Consumer Feedback Programs
OPOWER	AEEA & City of Calgary	Advancing Energy Efficiency in Calgary: Home Energy Reports Initial Program Design
OPOWER	OPOWER	Independent Evaluations of Opower Home Energy Report Programs
SkyFire Energy Inc	SkyFire Energy Inc	Recommendations for supporting Micro-Generation Solar and Community Energy Systems
Alberta Green Economy Network	Alberta Green Economy Network	Alberta Green Economy Network Submission to the Energy Efficiency Advisory Panel
Green Calgary Association	Green Calgary Association	Submission re: Education Energy Efficiency Panel
Canadian Solar Industries Association	Canadian Solar Industries Association	Promoting energy efficiency and community energy systems with solar electricity generation across Alberta
Canadian Solar Industries Association	Canadian Solar Industries Association	Promoting energy efficiency and conservation with solar heating and cooling across Alberta
YMCA Alberta	YMCA Alberta	Energizing the Non-for-Profit and Charitable Sector: YMCAs in Alberta Recommendations to the Energy Efficiency Panel
Learning for a Sustainable Future	Learning for a Sustainable Future	Role of Formal Education in addressing Energy Efficiency and Climate Change
Property Assessed Clean Energy (PACE)	Property Assessed Clean Energy (PACE)	PACE: A World Changing Green Buildings Financing Tool
Energy Savings Trust	Energy Savings Trust	Response to the Energy Efficiency and Community Energy in Alberta: Discussion Document
Metis Nation of Alberta	Metis Nation of Alberta	Preliminary Submission to the Government of Alberta Energy Efficiency Advisory Panel

Appendix J: Panel Code of Conduct

ENERGY EFFICIENCY ADVISORY PANEL CODE OF CONDUCT

Objectives

This Code of Conduct outlines the expected behaviours that guide Alberta's Energy Efficiency Advisory Panel members in all activities related to their mandated duties. By adhering to the expected behaviours, panel members strengthen the ethical culture of the panel and contribute to public confidence in the integrity of the work of the panel.

Expected Behaviours

Energy Efficiency Advisory Panel members are expected to conduct themselves in accordance with these expected behaviours.

Respect

- Panel members will be collegial and respectful at all times.
- Panel members will value diversity and the benefit of combining the unique qualities and strength inherent in a diverse panel membership.

Integrity

- Panel members will act at all times with impartiality and integrity, in a manner that will bear the closest public scrutiny.
- All panel members will represent one or more identified areas of expertise required to undertake their duties as a panel member.
- Panel members will perform their duties objectively and not represent any specific advocacy or political position on the topic of energy efficiency and community energy.
- Panel members will not lobby or be lobbied by external parties to the work of the panel.
- All potential conflicts of interest must be declared by panel members and, if it is determined there is an actual or apparent conflict, disqualify themselves from any situations that would bring their impartiality into question.

Transparency

- Panel members will not communicate about the discussions of the panel before the panel has agreed to the content of any public announcements in a collegial manner.
- All meetings and submissions will occur in a transparent manner.
- The Energy Efficiency Advisory Panel Code of Conduct will be discussed with the panel and agreed to collectively.
- The Code of Conduct will be publicly available.

Commitment

Panel members must ensure they are aware of, and comply with, the Code of Conduct.

I acknowledge that I have read and understand the Code of Conduct and I agree to abide by them.

Panel Member

Date