

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	Quantification Protocol for Energy Efficiency Projects: <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. Quantification Protocol for Energy Efficiency in Commercial and Institutional Buildings: <ul style="list-style-type: none"> Emission offsets are generated from implementing energy efficiency measures in commercial and institutional buildings. 	2007 - ongoing Revisions to protocols expected in 2017 to align with Alberta Climate Leadership Plan.
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

Table of Contents

BACKGROUND	1
RECOMMENDATIONS	1

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.

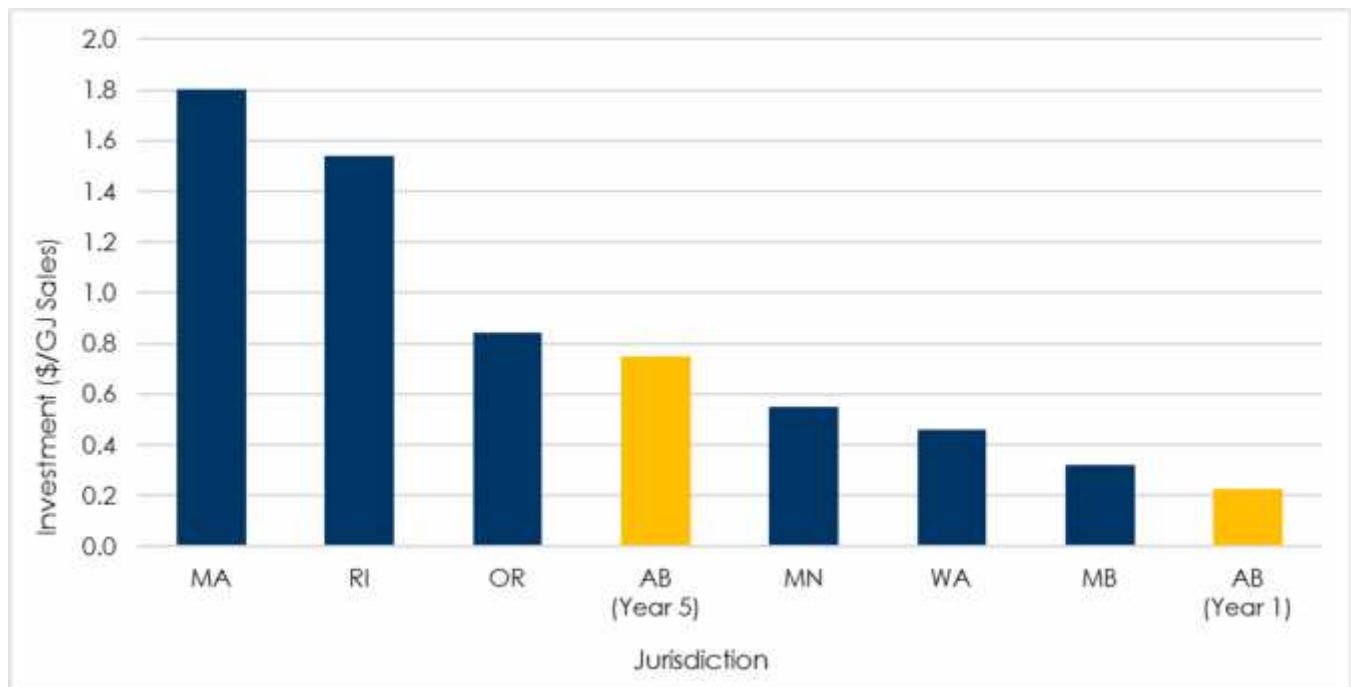


Figure 1: 2016 planned investment per unit of energy sold (excluding transportation)¹

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**:

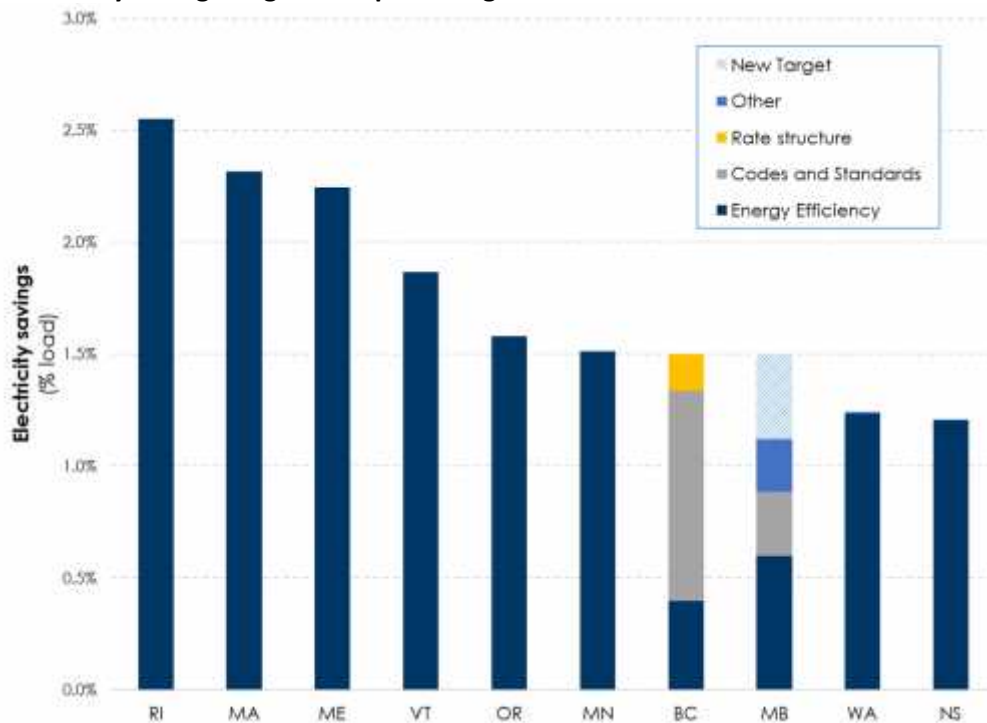


Figure 2: Electricity savings targets (2015+), as a % of load²

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**:

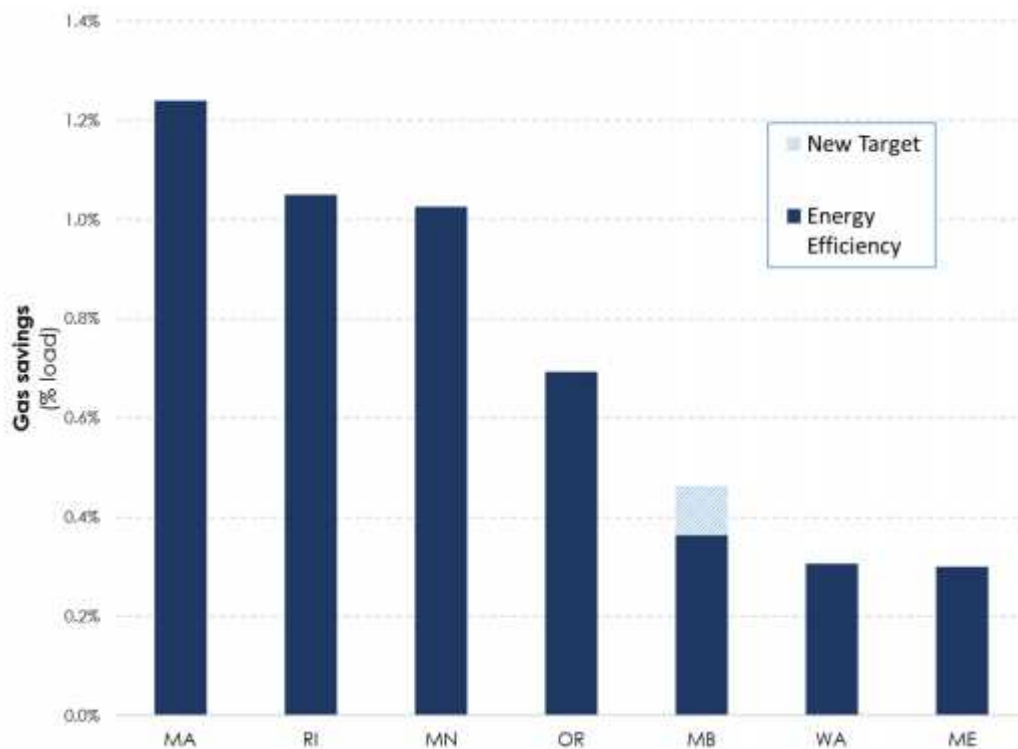


Figure 3: Gas savings targets (2015+), as a % of load³

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):

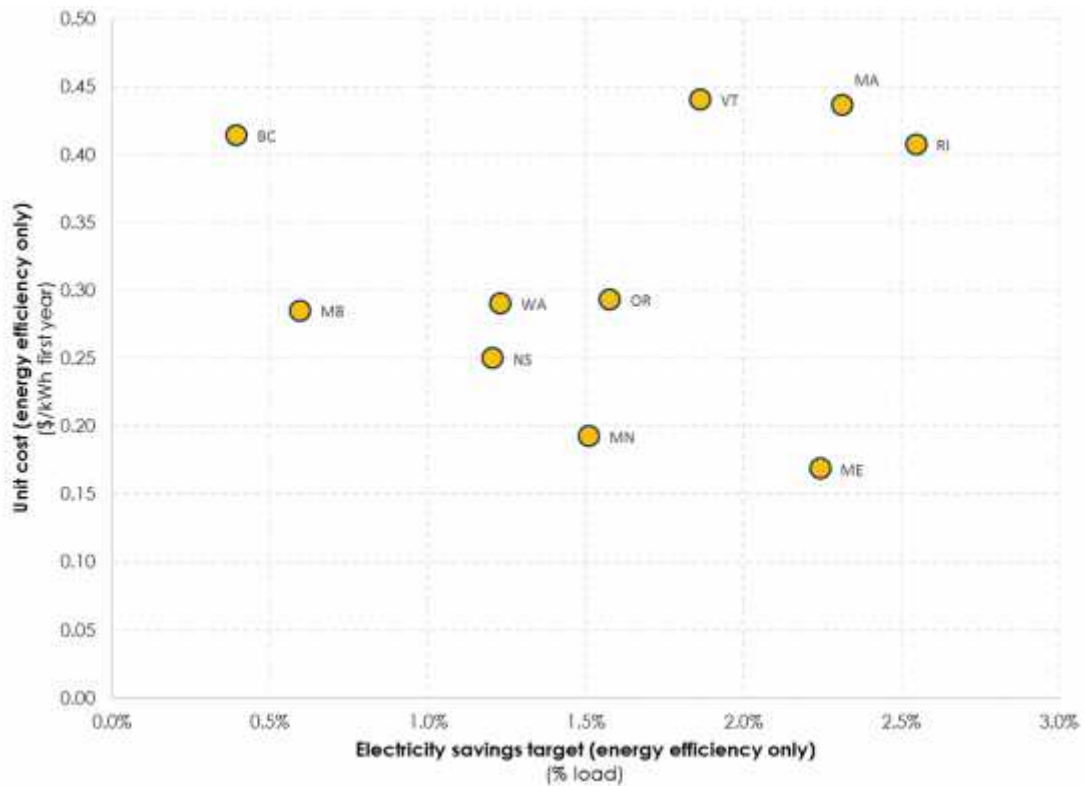


Figure 4: First year unit cost, relative to electricity savings target⁴

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:**

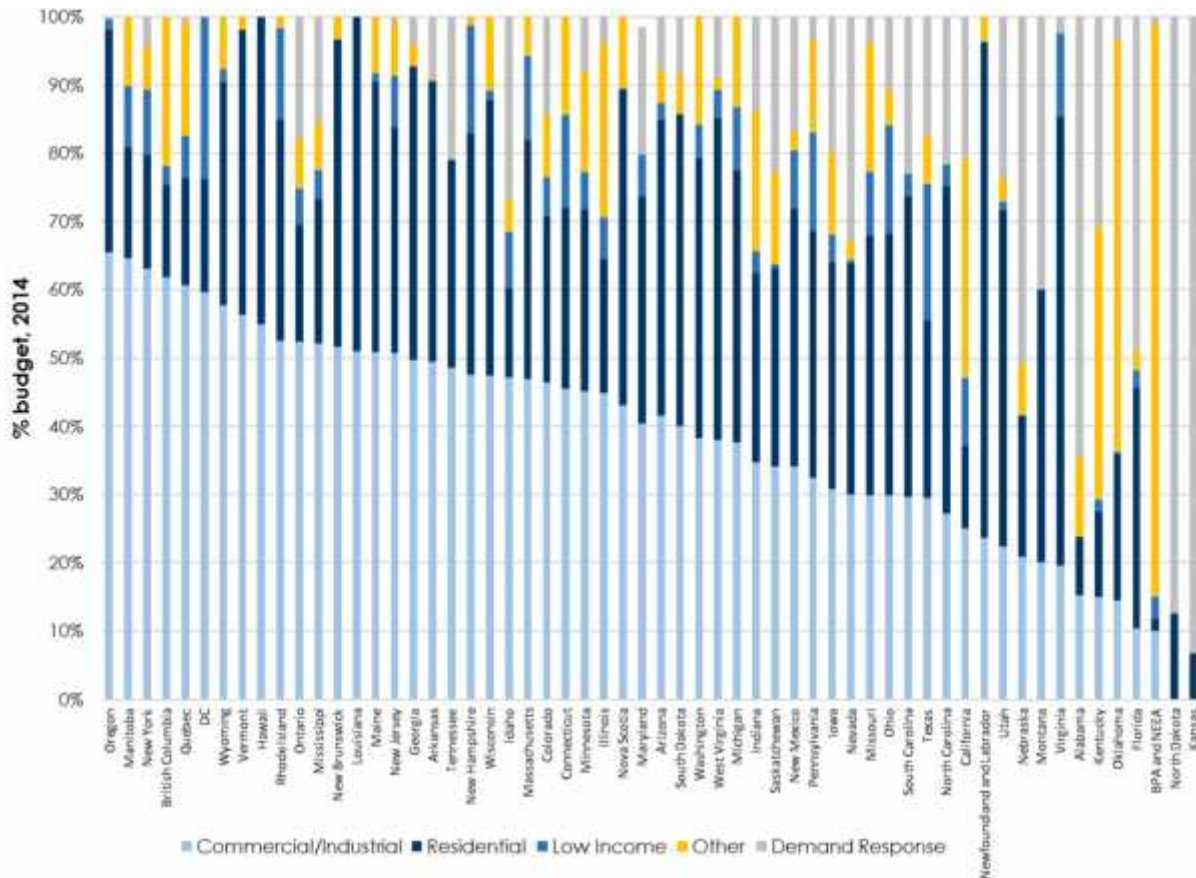


Figure 5: DSM Budget Proportion by Sector, 2014⁵

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 $\$/\text{kWh}_{\text{y1}}$ 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).

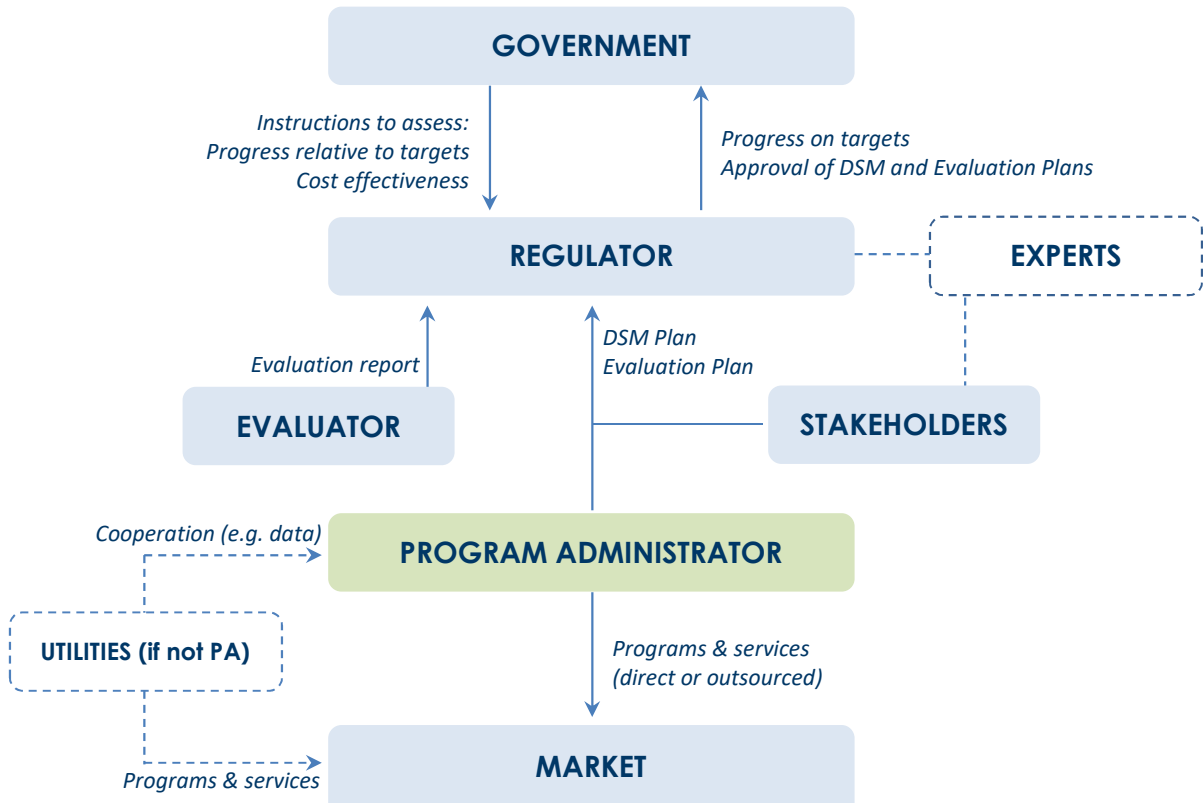


Figure 1: Overview of Generic Oversight Model

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:

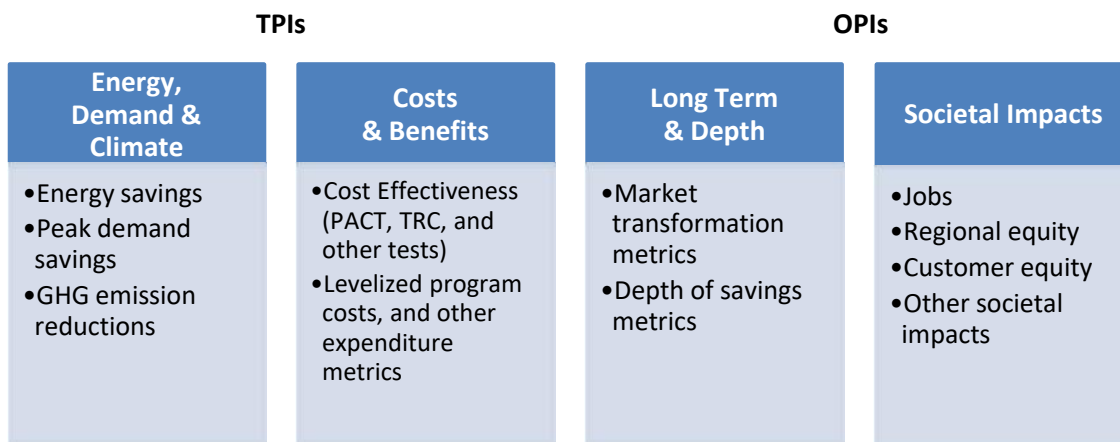


Figure 2: Common Key Performance Indicators

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 a 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.

References

- Averch, H., and L. Johnson. 1962. "Behavior of the Firm under Regulatory Constraint." *American Economic Review* 52 (December): 1053–69.
- Blumstein, Carl, Charles Goldman, and Galen Barbose. 2005. "Who Should Administer Energy-Efficiency Programs?" *Energy Policy* 33 (8): 1053–67.
- Blumstein, Carl, Seymour Goldstone, and Loren Lutzenhiser. 2000. "A Theory-Based Approach to Market Transformation." *Energy Policy* 28 (2): 137–44.
- Crossley, David. 2014. *Energy Efficiency As A Resource for the Power Sector in China*. Beijing, China: The Regulatory Assistance Project. Retrieved from <http://www.raponline.org/document/download/id/7259>.
http://www.efa.com.au/Library/David/Published%20Reports/2014/RAP_Crossley_EEasaResourceforthePowerSectorinChina_2014_AUG.pdf.
- European Commission. 2016. "Making Energy Retrofits a Standardised Product for the Finance Industry." *Investor Confidence Project Europe*. <https://ec.europa.eu/easme/en/news/making-energy-retrofits-standardised-product-finance-industry>.
- Gilleo, Annie, Seth Nowak, Meegan Kelly, Shruti Vaidyanathan, Mary Shoemaker, Anna Chittum, and Tyler Bailey. 2015. "The 2015 State Energy Efficiency Scorecard." Washington D.C.: American Council for an Energy Efficiency Economy.
- Golden, Matt. 2015. "From Programs to Markets: How to Make Efficiency a Valuable Real-Time Resource." May 21. <https://www.greentechmedia.com/articles/read/moving-efficiency-into-project-finance-by-paying-for-metered-performance>.
- Hamilton, Blair. 2008. "Taking the Efficiency Utility Model to the next Level." *Proceedings of the 2008 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, CA*.
- Harrington, Cheryl, and Catherine Murray. 2003. "Who Should Deliver Ratepayer Funded Energy Efficiency? A Survey and Discussion Paper." *The Regulatory Assistance Project*.
- IEA. 2014. *Capturing the Multiple Benefits of Energy Efficiency*. International Energy Agency. https://www.iea.org/bookshop/475-Capturing_the_Multiple_Benefits_of_Energy_Efficiency.
- International Energy Agency. 2011. "Energy Policies in IEA Countries: Norway 2011 Review." Paris.
- Jensen, Val R. 2007. "Aligning Utility Incentives with Investment in Energy Efficiency.pdf." National Action Plan for Energy Efficiency. <https://www.epa.gov/sites/production/files/2015-08/documents/incentives.pdf>.
- Kushler, Marty. 2004. "Public Benefits Funding Raids: Overall National Observations." presented at the ACEEE/CEE Market Transformation Symposium, Washington, D.C.
- Lazar, Jim, Frederick Weston, and Wayne Shirley. 2011. *Revenue Regulation and Decoupling: A Guide to Theory and Application*. Regulatory Assistance Project.
- Leach, Andrew, Angela Adams, Stephanie Cairns, Linda Coady, and Gordon Lambert. 2015. "Climate Leadership: Report to Minister."
- Neme, Chris, and Jim Grevatt. 2016. "The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years." Montpelier, VT: The Regulatory Assistance Project.
- Nichols, David, Anna Sommer, and William Steinhurst. 2007. "Independent Administration of Energy Efficiency Programs: A Model for North Carolina." Synapse Energy Economics.
- Torrie, Ralph. 2015. "Reflections on Climate Change Response Policy." Sustainable Canada Dialogues.
- Wheeler, David. 2008. "Stakeholder Consultation Process for an Administrative Model for DSM Delivery in Nova Scotia - Final Report."

ALBERTA ENERGY EFFICIENCY PROGRAM DESIGN PROGRAM OPTIONS

PREPARED BY:
DUNSKY ENERGY CONSULTING

Submitted to the Alberta Climate Change Office



(page intentionally left blank)

TABLE OF CONTENTS

INTRODUCTION	1
PURPOSE OF THIS REPORT	1
NOTES & LIMITATIONS	2
PROGRAMS OVERVIEW	3
CONSIDERATIONS IN PROGRAM OVERVIEWS.....	3
RESIDENTIAL SECTOR	4
BUSINESS, NOT-FOR-PROFIT, AND INSTITUTIONAL.....	7
CROSS-SECTORAL.....	8
CONCLUSION	10
APPENDIX A: PROGRAM HIGHLIGHTS	11

(page intentionally left blank)

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
<p>HOME ENERGY ASSESSMENTS/ EVALUATIONS</p>	<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>
<p>LOW INCOME SINGLE FAMILY</p>	<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>

<p>NEW HOME CONSTRUCTION</p>	<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>
<p>MULTI-FAMILY RETROFIT</p>	<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>
<p>RESIDENTIAL HEATING AND COOLING SYSTEMS</p>	<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>
<p>RESIDENTIAL DIRECT INSTALL</p>	<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>

<p>CONSUMER PRODUCTS (RETAILER-BASED REBATES)</p>	<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>
<p>APPLIANCE RETIREMENT</p>	<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>
<p>RESIDENTIAL SOLAR PV</p>	<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>
<p>BEHAVIOURAL FEEDBACK – HOME ENERGY REPORTS</p>	<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
<p>SMALL BNI</p>	<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>
<p>MEDIUM AND LARGE BNI</p>	<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
<p>INDIGENOUS</p>	<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>
<p>COMMUNITY ENERGY: FEED-IN-TARIFF</p>	<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
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.	Advanced 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 Chapter	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
Ecomi.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