

November 4, 2010 AEEA Conference Report

Introduction

With the goal of being *the premier energy efficiency event in Alberta for 2010*, the Alberta Energy Efficiency Alliance (AEEA) conference was convened in Calgary the November 4, 2010. The event was attended by about 100 delegates from the NGO, government and business community.

The goals of the conference were:

- to enable businesses, governments and other organizations to profile their work on energy efficiency (EE) to key audiences,
- to allow people working in fields related to EE to gain knowledge and contacts regarding EE activities within the province (and select activities outside of the province),
- to raise the profile of EE opportunities,
- to get people excited and enthused about EE opportunities in Alberta and increase the likelihood of people collaborating and taking action after the conference,
- to increase the level of energy efficiency activity within Alberta,
- to increase the profile of the Alliance with key audiences and to provide attendees with an enjoyable and rewarding experience.

In our view, these goals were largely achieved.

The remainder of this report will summarize the ideas shared by the panelists and among the audience and panelists at the conclusion of the buildings, industry, municipalities and government / non-government panels.

1. Buildings Panel Dialogue

(a) Buildings Panel Summary

- **Alvin Law, Alberta Infrastructure**
 - Referenced a number of EE demonstration projects
 - BOMA Building Environmental Standards (BEST) certified buildings
 - Technology is major tool to drive change
 - EE initiatives need to make business sense
- **Steve Clayman, Thermal Insulation Association of Canada**
 - Need to raise awareness of benefits of insulation

- improper insulation and installation can create highly negative consequences (e.g., corrosion, mold) and huge EE losses (e.g., mis-application on one valve leaks 29 MMbtu over one year)
- Poor or missing insulation creates huge energy losses and costs
- Addressing insulation creates some big energy savings and wins
- **Jim Love, University of Calgary**
 - We're in an EE "limbo dance"
 - Applying EE technologies in demonstration projects (e.g., Child Development Centre achieved a 65% energy use reduction, Lawrence Grassi School achieved a 70% energy use reduction at the same cost as traditional construction)
 - Objective is to reduce energy and improve the internal building environment
 - Under-floor air systems is an example of a technology that can help but for which there is no awareness
- **Bruce MacKenzie, Building Owners and Managers Association of Calgary**
 - BOMA BEST certified buildings involved four levels of certification with Level 4 being the highest - energy performance is key for level 4
 - Need more data to effectively benchmark performance and identify the factors for best performance with respect to newer buildings
 - Shared ideas around the need for new technology (e.g., triple glazed windows, efficient lighting), engaged management, trained operators, staff training, commissioning principals and tenant engagement
- **Jeremy Miles, ATCO Energy Sense**
 - Provides services to assess client's energy management
 - Provides free advice, education and outreach
 - Assessments are unbiased and focus on ways to improve EE
 - Current trend toward industrial applications - industrial users are getting involved versus history of commercial, municipal and large residential involvement
- **Trina Larsen, Canada Green Building Council**
 - Improve design criteria to deliver EE
 - Develop measures to determine if you are getting the benefits targeted
 - Third-party benchmarks are valuable

- Emerging *living building* challenge – the most energy efficient buildings possible with the target of zero emissions footprint - not just about the design standard but the approach also includes all energy use within the first year of operation (e.g., all internal use, all lighting, personal heaters)
- **Paul Chateau, 7th Generation Solutions**
 - Iroquois nation looked forward seven generations to determine impact of today's decisions
 - Provides consultative service to clients to develop and implement sustainable improvements in energy efficiency (e.g., trial in Banff of magnetic induction street lights)
 - Aggregate and deliver energy efficiency technologies
 - Raise awareness of energy efficiency practices
 - Evaluate needs versus use of energy
- **Elizabeth Huculak, Calgary Real Estate Board**
 - *Go green challenge* is a tool for rating the green efficiency of new and used housing
 - Incorporate EE ratings into MLS listings
 - working with energy advisors and evaluators to share measures and best practices
 - data sharing is essential to be able to build up a database that can be used to support financing for cost-effective EE upgrades and thereby better define value of green housing upgrades

(b) Buildings Panel Q&A & Table Group Discussion (Grouped into themes)

EE Barriers & Challenges

- Society is “riding the coat tails” of cheap energy - there are no penalties for failing on EE
- Multi-sectoral opportunities exist
- The lack of financing tools prevents EE opportunities from being realized
- We need to ask ourselves: *What are the four-minute-mile barriers on EE?* (How can we drive economies of scale on EE initiatives? How can we make the pursuit of EE practical for a home owner?)
- When we think of electricity supply, we need to ask how green is the Alberta grid - there is too much coal-fired electricity and we are too dependent on it
- We need to take on the challenge of connecting with consumers

- We need to change the model of delivering EE - make it convenient for consumers – explore turnkey solutions
- Capture the greatest prize at the lowest cost (e.g., focus on achieving 80% of net zero at 25% of the cost of 100%)
- The BIG goal is to one day achieve 100% net zero at no incremental cost
- The issues have not changed – *Where is the willful determination?*
- EE retrofits are part of an overall energy system and can be problematic if they are not considered as part of a whole system
- Existing buildings need to be considered as a focus as they have a huge role to play in EE for the overall system
- We need to have a holistic approach to building EE – we need to consider all factors (e.g., energy, water, site, IAQ, materials, education, health, etc.)
- We need to fight the perpetual myths that net zero homes cost \$1.2mm, that green always costs more and that certification offers little value
- We also need to explore the primary barriers for advancing EE initiatives with building operators – we need to understand their key drivers (e.g., economic, environmental, societal, etc.)

Economics & Finance

- How can we afford EE? How can we afford not to embrace EE?
- We need to identify the big gains that are most cost effective
- Return on investment (ROI) on EE is not just about cost - it is also about creating a better environment for people that supports better health outcomes and other human factors that have business value but are not necessarily reflected in a simple ROI calculation
- Alternative financial metrics are needed - NPV, lifecycle and cash flow are factors to be considered in the life of an EE initiative
- Affordability of EE projects is an important factor in the decision-making process that needs to be better understood and communicated
- Financing is a hurdle in making EE improvements
- There is a lack of grants – loans and longer term financial support for EE
- Question of how to capture the same economies of scale in residential opportunities that exist in industrial and commercial applications – the economies of scale do not transfer to small consumers
- We need to recognize that consumers are not paying the full lifecycle cost of energy and are not factoring potential future energy costs into their EE decision making

- Need to answer the question: *What does it actually cost to be energy efficient?*
- There is a disconnect between building capital costs and building operating costs when making EE decisions

Education & Communication

- #1 factor is information – we need better dissemination of EE information
- Need to drive *behavioral energy efficiency* – how to get people to make small changes, which when aggregated, become big changes
- Need to build energy efficiency awareness – building energy use is 40-60% EE prize and therefore needs to be emphasized
- Need to build consumer knowledge of what is available, why EE is good for them and provide validated ROI-based evidence
- Need to explore how to convert EE principles into practice
- Selling EE through ROI and the business case
- EE is not necessarily sexy - translating EE to financial benefits – increasing value or reducing costs can make EE sexy
- Emphasize consumer education to communicate role and benefits of EE
- Information is available on EE issues and solutions but it exists in silos - there are no holistic EE approaches being advanced

Policy & Regulation

- Update the building code so builders can be knowledgeable, trusted advisors who communicate the benefits of EE to consumers
- Education, auditing and new building codes are needed to make EE real and tangible
- Full disclosure of EE measures and performance of buildings should become mandatory (e.g., EnerGuide ratings)
- Build EE changes into building codes is much easier than educating consumers – building codes have been the most effective means in creating timely change
- Need to certify builders and benchmark the products being built
- Explore price/cost versus EE performance
- Operating costs are an important input to better purchase decisions
- Need to make certification of builders and reporting mandatory

- Air quality in buildings must be integrated into the EE model – it's not good enough to just improve EE, we must also maintain quality of environment in the building
- Mandate that every new home must have an EnerGuide rating – establish and benchmark building code requirements – the sooner the better

Technology

- Technologies are constantly changing as is the price/cost parameters
- Need to ensure that information on these changes is continually updated to best influence decisions
- The real challenge is getting EE technology into use

2. Industry Dialogue

(a) Industry Panel Summary

- **Jim Petridis, Irex Contracting Group**
 - Large specialty contractor in North America - insulate pipe, ducts and equipment on all types of installations, measure performance, infrared technology, services include audits and solutions, certified appraisers
 - Quantify solutions and ROI as well as GHG improvements
 - ROI in steam systems
 - Insulation is carbon negative - reduce costs, reduce polluting emissions, control condensation, control mildew, corrosion, improve work environment, improve workplace safety and health
 - Improve process control
 - Improve facility lifecycle costs
 - Reduce construction costs is often at the expense of operating costs
 - Improper installation can negate benefits
- **Dave Hassan, Cenovus**
 - Implementing corporate EE
 - Operate upstream oil and gas production (e.g., in-situ oil sands, CO2 sequestration, projects for EE engine controls, instrument air systems, pump electrification, facility consolidation)
 - Have spent \$60mm and have figured the CO2 e reductions
 - Production Efficiency (PE) for conventional E&P projects is a lower threshold than EE projects

- EE projects do not have to meet the same ROI/PE targets, so they have been done EE regardless of ROI thresholds
- Have a dedicated fund for EE upgrades

- **Bryan Tyers – Westedge Consulting**
 - Energy and emissions management consulting is a known issue in 2010
 - Help clients make informed decisions about energy-related decisions and projects
 - Focus on effectiveness and efficiency
 - Energy usage assessments (audits) are the starting point
 - Have completed many EE studies for various industries and government
 - There is a need for monitoring and targeting energy usage
 - Only 25% of industry knows what their energy usage is
 - Technology doesn't work if people don't know how to use it
 - Need to take a holistic perspective when EE efforts conflict with one another

- **Mayne Root, Alberta Motor Transport Association**
 - Trucking is focused on green engines, which sacrifice efficiency – new engines have reduced NOX and SOX but have reduced fuel efficiency (e.g., old engines at 10-12mpg versus new engines at 5-7mpg)
 - Paradox: new engines cost more and fuel costs more
 - Need new ways to manage fuel efficiency
 - Addressing driver habits and management practices can improve fuel efficiency by 30%
 - Need to assess extra "soft costs" (e.g., increased time and labour)
 - Equipment choices or "hard costs" can save another 20%
 - Installation, maintenance, aerodynamic improvements add costs, but can reduce fuel costs
 - Advancing new *Trucks of Tomorrow* program – fleet efficiency program with case studies, workshops, fleet analysis, rebates, etc.

- **Brian McCready – Canadian Manufacturers & Exporters**
 - CME supports EE and GHG reduction

- EE is driving GHG reduction performance
- Studies have been completed on EE of provincial governments and on what is being done by 40 different companies
- Exploring the EE opportunities, barriers, ideas-to-action plans
- Need to explore heating, ventilation and air conditioning (HVAC) opportunities, process cooling and process heating
- Explore management changes needed to effectively communicate the importance of EE, training and planning and action plans
- Stantec is completing an audit-to-action pilot program
- **Rick Atkins – Alberta Agriculture & Rural Development**
 - Exploring EE in agriculture
 - Current situation is 50,000 farms with only 3% of provincial energy use
 - 70% of energy use is motive and 30% is non-motive
 - Agriculture has achieved 18% decrease in energy use in the last 10 years
 - Direct and indirect inputs and outputs should be considered in overall energy balance
 - Climate change action strategy
 - Irrigation efficiency saving 28 GW and 4.7 MMcf of water
 - *Growing Forward*: renewable energy initiatives, insulation, etc.
 - Need incentives for better EE systems
 - Baseline information is a key challenge as is the evaluation of technologies
 - Need to realize benefits and payback - current farm economics big effect

(b) Industry Panel Q&A & Table Group Discussion (Grouped into themes)

- Q: *What initiatives has the trucking industry done on the fuel switching side of things?*
A: Reviewing energy inputs (e.g., biodiesel, hydrogen, natural gas, etc.). Need to evaluate operational impact and economics.
- Q: *Did Cenovus EE economics include GHG reduction offset value?*
A: No. Cenovus is just starting and getting data back from operations.

EE Barriers & Challenges

- Need to understand the common barriers across industries

- Cross-feeding knowledge and learnings from one industry to others is important
- Need for change and to address change management in EE projects
- Need for more integration in EE (e.g., cogeneration plant supplies power and heat for many neighbors)

Economics & Finance

- Economies of scale in operations don't translate to small organizations, which have a harder time to buy into EE
- There is a need for a simple business case for EE for smaller businesses
- Access to capital for EE projects a challenge
- Need to clearly define the positive business case for EE
- Financing issues are a big factor for industry – EE projects must compete for capital internally
- A green management mandate helps EE projects compete for internal capital
- Need to better understand the capital costs versus the operational cost savings over time in the EE business case
- Opportunity to finance EE projects externally - an outside company pays for the improvement and recovers their costs and receive an ongoing benefit after payout
- Build the business case in sharing EE benefits between capital providers and business operators
- There are companies that will finance performance-based EE projects in the U.S.

Education & Communication

- EE at DuPont – EE is good business as a case study
- Need a clear simple business case template
- Transparency is key
- Need to link EE operating costs to competitiveness

Policy & Regulation

- Change corporate reporting requirements to make EE metrics, social responsibility criteria, etc. a public company reporting requirement
- Change accounting to add environmental and EE financial accounting in corporate reporting

- Carbon pricing could be used to drive EE - could be a big motivator in some cases
- Effect new supply chain management policies to require suppliers to meet EE standards (e.g., green company qualifications)
- Conflicting interests can occur when implementing multiple EE applications

Technology

- Process controls are the #1 opportunity for improvement
- In applying new technologies, there is a need for knowledge and expertise to get the expected benefits

3. Ideas Surfaced in AEEA Lunch Time Presentation – Jesse Row

- Members: 23 organizations and 13 individuals
- Significant EE potential with significant return on investment and carbon reductions at \$0 / tonne CO₂e
- Incentives leverage consumer spending, increase GDP and government revenues
- Employment higher than for power generation
- Activity areas: events, discussion papers, gov't initiatives, board meetings
- AEEA has already demonstrated successes
- By working together, we all achieve more

4. Surfaced in Municipalities Dialogue

(a) Municipalities Panel Summary

- **Russ Smith – City of Medicine Hat**
 - Energy sustainability manager, renewable and conservation
 - Need to:
 - establish targets
 - educate (e.g., seminars, home and building audits)
 - develop programming (look around, align with others)
 - build awareness (e.g., – website, newspaper column, trade shows, share targets)
 - Data and information must be relevant
 - Local data counts

- Need to provide metrics for consumers and benchmark against other programs
- Need to leverage other government initiatives and information
- **Brad Rabiey – Municipal Climate Change Action Centre**
 - Government of Alberta and municipalities working together to create a one-stop shop for EE information
 - Municipalities focused on reducing emissions for municipalities
 - Communication and education to inform the planning process
 - Business planning defines specific issues and drives action
 - Project showcases demonstrate results for constituents and neighbours
- **Muhammed Abbas – City of Calgary**
 - The role of municipalities in EE is to develop safe and viable communities
 - EE can be advanced through legislation, leadership and luring consumers (persuasion)

(b) Municipalities Panel Q&A

- Q: *Can "net" metering work without incentives?*
A: Smart metering is going ahead, but there are no formal net metering incentives in place yet.
- Q: *Are there any incentives for community centers to take on EE?*
A: There are no grant programs at this point to support arenas. Calgary has sustainable building programs using provincial money which is targeted at city facilities and community centers may fall under that program.
- Q: *Is there a role for municipalities to incorporate road orientation to accommodate solar power orientation for housing?*
A: Medicine Hat will consider these initiatives in their design considerations. There is a need to build awareness on this issue so it can be incorporated into codes and into discussions with developers.
- Q: *How does Medicine Hat resource its EE initiatives?*
A: Medicine Hat has a surcharge for energy use above a set level. The funds from this surcharge go to support EE initiatives.

4. Conservation Potential Review (CPR) Presentation

(a) CPR Presentation, John Rilett, Climate Change Central (C3)

- C3 performed Conservation Potential Review (CPR) – quantifies potential for EE in Alberta (e.g., GWh per year, PJ/yr)

- CPR identifies sectors and end-use activities offering the greatest potential
- Evaluate technical potential, economic potential, achievable potential and program potential
- EE target scenario – baseline model – business as usual, modeled scenario – move from base case to benchmark case
- Goal of Alberta performing better than 90% of other provinces
- Develop a total theoretical EE gap between models
- Leverage energy use forecasts for different cases
- Level of disaggregation a challenge – NRCAN database provides metrics for modeling case forecasts and total theoretical EE gap, natural gas and electricity savings
- Detailed breakdown of savings by specific usage (e.g., commercial and residential)
- Economics are significantly affected by energy costs
- Next steps: sensitivity, additional work, model potential, explore broader economic multipliers from EE

(b) CPR Presentation Q&A

- Q: *What types of buildings are included in the model?*
A: All types. The types included need to be specified in the breakdown to improve understanding.
- Q: *Is the best province scenario corrected?*
A: Yes, the modeling has been temperature corrected and technology corrected.
- Q: *If the government transferred some of the CCS money to EE could it realize greater reductions and economic benefits?*
A: Yes, better returns from EE which could affect and benefit every Albertan.
- Q: *Does the model consider the effect of additional jobs which could be created as a result of EE initiatives?*
A: Yes, there is a multiplier effect.
- Q: *How does Alberta compare today to other provinces?*
A: In electronics, high performance. In HVAC, second worst.

5. Ideas Surfaced in Government & NGO Panel Dialogue

(a) Government & NGO Panel Summary

- **Goldie Edworthy, Alberta Environment & Chris Arnot, Alberta Energy**

- Joint presentation
 - EE is driven by public policy
 - Provincial energy strategy - use, production and prosperity
 - The wedges are conservation & EE, greening energy production and CCS
 - Environmental footprint considers land use, water conservation, economic competitiveness, energy savings
 - Need to consider information and education
 - Incentives can play a role – consumer rebates, lighting program, transportation program
 - Research & development - QUEST, university design, smart meters, fuel use best practices, CCEM fund
 - Regulation – codes, standards,
 - Working with NRCAN to develop an EE action plan to meet targets and implement into provincial energy strategy
- **Simon Knight, Climate Change Central**
 - C3 is doing some great work in Alberta
 - Proud of the success AEEA in creating this forum
 - C3 is an arms-length organization for reducing GHG emissions in Alberta that is provincially funded and delivering multiple programs
 - Delivering rebate programs to home owners, taxis, trucking
 - Enmax, employee incentive programs (see C3 website for more)
- **Suzanne Kiraly – Canadian Standards Association**
 - CSA provides standards and conformity assessment programs; testing & certification, standards & codes, application tools, training & personnel certification, advisory services and manages over 3000 standards
 - CSA testing labs recognized by NRCAN
 - CSA harmonizes with international standards and working with international groups on 1400 environmental & EE standards
 - The AEEA conference discussion is happening all over the world
 - Key drivers are to ensure energy supply, improvement costs and efficiency, to create green jobs and reduce environmental impacts
 - Sustainable manufacturing is a new ideas and ISO 50001 is the emerging international energy management standard

- **Paul Clark, Climate Change and Emissions Management Corporation**

- CCEMC is a not-for-profit organization that reports to the Alberta Environment Minister
- CCEMC takes the \$15/tonne levy from large GHG emitters and puts it to use focused on discovery, development and deployment of clean technologies
- CCEMC invests in conservation & efficiency, CCS, greening energy production, renewables
- \$186 million in first-round funding

(b) Government & NGO Q&A & Table Group Discussion (Grouped into themes)

- *Q: Is there any plan to support initiatives targeted at small emitters like the CCEMC funding for large scale projects which are typically partnered with emitters?*
A: Yes.
- *Q: What is the economic potential for GHG reduction and how does it compare with government target to 2050?*
A: The economic potential for GHG reduction is greater than the target set by the government.
- Perspectives on carbon trading markets: carbon is trading in Europe for \$26/t, California is developing a carbon market, carbon markets in North America may occur one or a few jurisdictions at a time
- In order to make best EE decisions it will be necessary to link capital investment and operating dollars – the interrelationship must be clear to make better decisions, ask for improved guidelines to make decisions on capital versus operating decisions
- Alberta is not alone in its EE efforts: EE is global, EE can save money, save the environment and save lives
- We need to create alliances with other organizations and other jurisdictions
- Alberta is on the world stage as a world-class energy supplier so it can be on that stage as a world-class EE driver

Policy & Regulation

- EE projects could be financed on a provincial bond program where bonds pay back based on the EE savings
- There is inconsistency in policy and focus at all levels of government and among departments (environment, energy and finance in particular)
- There needs to be more collaboration and coordination among governments

- There are 12 Alberta Government departments working together on provincial energy action plans
- Provinces do not want to duplicate the effort of the Federal Government – Alberta should focus on areas where the Federal Government is not

Energy Supply

- There is no master plan for the grid in an open power market
- Power grid needs to be flexible and support demand considering all supply cycles and scenarios - wind power is not 100% uptime
- Distributed solar power could be a major supplement to the grid without requirement for new or large infrastructure
- *Greening the grid* is an initiative for sustainable development of the grid in innovative ways using new technologies and new business models
- Solar power is becoming more economic and the new grid needs to allow for other technologies so more supply options are practical