

Energy Efficiency Advisory Panel Technical Stakeholder Workshop – Buildings - July 12, 2016

Consolidated Raw Notes

Most Important Messages

- Get municipalities on board- incent or regulate
- Try new things, be experimental.
- Government needs to lead by example.
- Celebrate current success and build on that.
- Democratize the system- Don't focus on payback by investment due to risk of not going (messages need to be delivered around every day savings)
- Time is of the essence- act now.
- Stop talking, do something, be bold.
- Don't reinvent the wheel
- List of resources that are vetted- save!
- Make it fun. Corb Lund song (marketing is essential)
- Focus on young Albertans- it is their future
- Show value with your performance
- Equate this to \$
- An effective program doesn't equate lower cost.
- Need sector specific messages
- Fun for public- Know audience
- Engage Albertans and keep engaged
- Don't let big business overshadow home owners
- See what other Provinces/Countries are doing, learn from them, learn from the best
- Needs to be about results, getting metrics right
- Need to establish portfolios of programs
 - Cost and not-cost based
 - Education programs should be treated differently
- Government and public sector buildings need attention; government needs to get its own house in order.
- Needs to be government transparency on impact of building fleets
- Need to leverage \$645 million between other orders of government and private sector.
- Alberta-focused programs are essential (local, companies, providers, etc.)
- Engage Albertans over the long-term
- Effective incentives (no short-term programs) (programs should be volume driven)
- Youth-focused programs
- Government decisions on buildings to lease/buy should align with policies (CLP, etc.).
- Energy Efficiency Alberta needs to be non-partisan
 - Rotating board (2-3 year terms)
 - No outrageous compensation
 - Arms-length, independence
- Align with other levels of government (municipal, federal)
- Use cities and existing programs, leverage to assist with delivery.
- Public participation and marketing is important
 - Ambassador is needed
 - Premier needs to demonstrate own green efforts to the public.
- People and communities are generators (electricity), government should take advantage

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- Look at communities and specific buildings (viewed equally as important)
- Do not fund Just one technology (focus on comprehensive measures/approaches)
- Incent private companies and individuals to invest in energy efficiency and carbon reduction
- We need to affect change through a performance based code (applicable to all) Bring up the minimum (raise the floor)
- Build a foundation of cultural change (Start early with youth) (kids need to take this home to their parents)
- Certified designers and installers for incentive monies (managing gold rush)
- Show value and performance
- Don't allow anyone to opt out (Carbon levy)
- To EE Agency should manage any loans that go out
- Sustain longevity of program
- Stay true to commitment to engage/involve/indigenous community, rural agriculture, marginalized people in community
- Break down silo's in government departments
- Go beyond rebates to self-sustaining mechanisms.
- Learn and investigate global action
- Recognize the strengths of these communities
- Albertans and their efforts are part of solutions (Acknowledge and recognize)

Setting the Vision

- Need to change impression of carbon levy, that this is not just a tax, and that money is being used wisely/effectively.
- Inject CLP vision into school curriculum, especially early education. This will help to create culture change among younger generation. Parallel to recycling curriculum from the 90's.
- Need to bridge urban and rural divide; and provide opportunities for all Albertans to participate (e.g. rural, urban and indigenous communities).
- Need to communicate tangible 'kitchen table' benefit to all Albertans (e.g. economic outcomes). Every Albertan needs a story on how the Agency is benefiting them.
- Alberta/Agency needs to be viewed as a leader (for its ideas, methods, and technologies); a model for other jurisdictions. Alberta can be a leader in energy efficient construction.
- Rebranding Alberta's image: we are known for Oil Sands, and now, also for energy efficiency.
- Agency needs to showcase program successes. Highlight stories across all sectors.
- Regulations should be in place to reduce GHG emissions; limit emissions from buildings (e.g. building codes). Also need regulatory support to improve building efficiency (e.g. passive house certifications). We should also consider a path/roadmap for Alberta made products.
- Short-term focus: incentives/grants for retrofits and new builds (e.g. net zero), and provide support to municipalities (e.g. building and planning inspectors). Medium-term focus: pushing beyond national building codes.
- Important areas of focus for Agency: awareness, education, capacity development, demonstration projects.
- Develop targets (e.g. half of new homes in Alberta minimum net zero by XX date).
- Need to develop a sustainable green industry, and show how programs are leading to economic diversification (e.g. growth in green jobs vs jobs lost related to coal phase out). Goal is to get Albertan's to take pride in green energy/green economy.

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- Need projects/programs that are visible (e.g. solar) to public. Efficiency not always visible.
- Incentive programs should be clear and recognizable to stakeholders/Albertans.
- Leverage Alberta's entrepreneurial spirit. Agency is a catalyst for integration and driving Alberta's innovation attitude.
- Agency needs to collaborate broadly and achieve connections across sectors/communities.
- Education: help create understanding in communities on carbon footprint; empower Albertans to make informed buying decisions. Pilot/demonstration projects are important tools to illustrate benefits of energy efficiency/community energy.
- Need to show how Agency programs are leading to meaningful/absolute GHG reductions.
- Establishing partnerships is important to program success (e.g. utilities, industry, builders, and institutions).
- Government needs to lead by example (improving efficiency of GOA buildings/operations).
- Agency-led programs will allow innovative technologies/processes to be considered.
- In five years, Albertans and industry need to feel Agency has value, and want to keep it.
- Agency needs to carefully examine successes/failures in other jurisdictions.
- As a result of Agency programs, citizens and communities transform into "prosumers" (producers/consumers of energy), e.g. micro-gen, CHP, community generation.
- Visibility of Agency after five years: seen as the go-to place for all matters related to energy efficiency; and it's a household name in Alberta (and outside the province).
- How does Agency recognize/reward early adopters? Early adopters can help lead stakeholders who have not taken action.

Key Points re Vision:

- Education: Parallel to recycling is a strong example; need to pursue culture/attitude shift.
- Constituency buy-in needed in order for Agency mandate to survive.
- Building Codes will not have big impact in short-term; need to target retrofits.
- Need to focus on Alberta's strength: Albertans come together to accomplish tasks, have an entrepreneurial nature, and province has a young population (Calgary one of the youngest major cities).
- Need to showcase and build upon existing successes (e.g. new GOA buildings are LEED).

Confirming and Overcoming Alberta's Barriers

Are there barriers not listed (p.7 of Discussion Document) that you think are important?

- We are exporters of talents due to the perception that you cannot grow your business
- Lack of access to capital hinders creating high tech sector
- Consistency in language (e.g. GHG credits... opportunity vs. monetization)
- PACE (pairing financial institutions with public sector dollars)
- Economic Barrier
 - Pay back (install, saving, value)
 - Standing offer
 - FIT
 - Linked to payback period on infrastructure: lender criteria
 - Interest rates: already low
- Lack of consistent data: cost of data, insulated culture
- Lack of transparency/rigour of costs

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- Lack of incentives and penalties
- Lack of pilot projects to work out financing bugs
- Cost transparency: understanding true costs of energy, what does your bill mean? Also understanding fixed vs. variable on energy bill.
 - Understanding costs of various components of energy including lights, power, water, and how to be more efficient
- Culture shift: going from an “oil province” to something new
- General level of mistrust/discomfort with utilities and with people conducting energy audits and with government
- Conflicting incentives: utilities companies are incented by economic benefits of being profitable
- Very low energy/electricity prices in Alberta (compared to Europe for example)
- Information Restrictions (FOIP)
- Utilities: non-consumption based fees; accounts open; business model
- Access to products for residential/commercial construction (e.g. exterior insulation, EE windows, etc.)
- Culture in Alberta and history of failed EE programs
- Planning time for community scale and # of parties required to be involved
- Current utility model not conducive
- Current building/electrical codes: need ongoing signoff and requires CSA
- Lack of energy efficiency mortgages (tied to home appraisals)
- Inertia: happy with the status quo... the current system still works!
- Lack of data: knowing current energy usage data for all building forms and load profiles
- Financing energy efficiency additions: lack of long term low cost financing available
- Need economic argument that makes sense, is culturally desirable
- Well-established existing industry: oil & gas and utility companies
- Visibility of EE: not sexy, hidden
- Sensitivity over debt
- EE is hard to measure
- Longevity of mandate: political risk/public support
- Challenge to allocate funds across all sectors to get a movement happening quickly
- First Nations consultation as per treaty 6: reaching each FN community
- Lack of awareness of “true costs” that are non-monetary and considered “externalities” in our economic system (i.e. health)
- Consistent, efficient permitting system for community energy at municipal level
- Managing the “gold rush”: quality assurance
 - No certification/minimum standards to ensure installation is done properly
 - No framework to ensure qualified individuals are doing the work
- Occupant training & education (not just building maintainers, but end-users)
- No energy literacy in curriculum
- Resistance to change is because it’s overwhelming, too much for people to think about
- People don’t know how to turn on/set EE settings
- Incessant focus on economics vs. compelling opportunities

What are the most significant barriers to adopting energy efficient and community energy system technologies that are common to all sectors? Unique to some sectors?

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- Regulatory barriers: microgen regulation inconsistent at all different levels of regulation
- Taking the dialogue outside the circle: need to express benefits in terms of dollars instead of electricity terminology
- Lack of incentive for service providers to promote EE
- Transparency for energy consumer billing
- Upfront costs
- Commodity risk
- Codes and standards will be key!
- Long-term, lower cost financing availability
- Technical capacity (trades, municipalities, public)
- Monolithic utility model
- Building awareness through language that people can understand
- Sensitivity over debt/ownership transfer
 - Payback period + pricing
- Longevity of mandate: political risk/public support
- Creating a culture shift in a short time frame
- Will be hard to achieve meaningful and measurable CO2 reduction
- Technological risk
- Existing industry and utility companies are a barrier to community energy systems
- Making a compelling business case across all sectors for investing in EE (Awareness + Payback)
- Technological risk/capacity: trying new things and having lack of technical experts available locally
- Current school curriculum needs to be updated to include EE: hands-on opportunities as well as academic subjects like science
- CO2 and climate change are difficult concepts for the general public to understand: not tangible
- Need effective communication channels/networks to quickly and effectively share success stories to broad ranging audiences
- Managing the “gold rush”: quality assurance
- Incessant focus on economics vs. compelling opportunities
- Labelling and visual marketing: building awareness of energy ratings and what that means
- Gold rush for geothermal technology
- Sub-metering for multi-family dwellings
- Not knowing how to reach each audience in the most effective ways

Measures of Success

Flip Chart 1

- Implementing curricula changes & changes at facility level (Solar on schools etc.)
- # GHG Reduction
- How much “global best practice” is being used
- Degree of popularity
- Other jurisdictions following us?
- Google Ranking (program or tech etc.)
- Ability to, or actual adaptation to market forces (e.g. Natural gas spikes?)

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- Polling for degree of awareness & uptake
 - Adoption rates
 - Consumers
 - Service Providers
- Measurement of market transformation (are you moving to target)
- Increase number of green jobs
 - By Regional sector
 - Where are we seeing the benefit?
- How well is it being integrated into the broader energy system?
- Measurement of cross sector benefits
- Energy disclosure of all sectors (transparency)
- Environmental Reclamation (indirect)
- Equitable access & implementation across all sectors (not just certain players)

Flip Chart 2

- Economic diversity: more jobs, diverse opportunities
- GHG, NOx, CO2, Methane emission targets
- Cost effectiveness
 - E.g. GHG reduction/\$1000 spent
 - What is the gain per \$ spent?
- Jobs created, treasury saves money
 - Make sure metrics are positive as opposed to cars off the road for example.
- Benchmark
 - Transparency & open data
 - Where we were, where we are, where we are going
- Consumer acceptance/buy in
 - Desire of continuity
- Geographic reach / # of communities
- # of start-ups & new businesses
- Longevity/persistence
- Measuring buy-in of different sectors & adoption rate (e.g. Forestry, agriculture)
 - Including non-profit sector
- Adoption rate for distributed energy systems at community level
- Need to create standards for measures that are understandable to lay audience
 - Cost e.g. For instantaneous energy use
- Quality of benchmarking data
- Tracking energy savings that occur indirectly.
 - Water conservation
 - Planning

Flip Chart 3

- Put CO2 – GHG usage on all electrical & gas bills in the province (environmental profile)
- Create a standard of understanding of measurements
 - GHGs, Put a \$ amount on this
- Level of non-government money going into the program
 - Report on leverage

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- Track employment on a regional basis
- Track cost-savings
 - E.g. Average cost of household in 2015 compared to 2016
- For “program” measures
 - GHG emissions saved, reduction
- Transition of oil/coal workers to a diverse economy.
 - Electrician can go from oil patch to putting in solar panels without needing re-training
- Show the cultural shift
 - Success Stories
 - Benchmarking first
 - Surveys
 - Insight into community perspectives

Evaluating Programming Tools and Technologies

Is anything missing from the lists that needs to be considered?

Table 1

- Need to address a variety of audience needs – focus on who is being targeted
- Should go beyond rebates, e.g. PACE loans
- Should identify contractors to access for good performance
- Could do energy census of buildings in AB – need to be general and simple to give broad sense of status/baseline
- Offer grants for non-profits
- Look to lending institutions for energy efficiency loans (is done in Sask)
- Need changes to electricity rate reporting, i.e. the ratio of fixed to variable
- Need regulatory credit for utilities that increase efficiency or watts from sustainable sources, e.g. solar
- Need clearinghouse for accredited service providers, financing, etc
- District energy systems
- Ventilation in residential retrofits must be addressed first!
- Need AB sources for insulation & windows that are best technology (from Europe now)
- Whole system view of energy efficiency improvements for residences/commercial buildings
- How to address this in Heritage buildings important too – what technology should be used in these situations to still preserve the historic features
- Efficiency in public transportation
- Urban planning for energy efficiency

Table 2

- Missing “Leadership by Example” – GOA and others must lead – tools like performance contracts are well suited to support government improvements. Helps build/ramp capacity in the market
- Promote energy efficiency and community energy services industry – not undeveloped in AB – exists today and can grow. Public School Borrowing Act requires ee retrofits with performance guarantee
- Missing “Green Fund” or Revolving Fund that funds green projects with savings going back to fund. Supports sustainability over the long-term
- PACE program – addresses change in ownership – typically tied to tax bill

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- SMART Meters and similar infrastructure – demand side management
- Leveraging other sources of funding, e.g. \$120 B in federal funds over 10 years & private business & homeowners investment
- Caution re: unintended consequences – “gold rush”
- Holistic approach – demand reduction – comprehensive measures
- Automated controls
- All motors – not just auxiliary
- Pumps
- Geothermal Exchange
- Process refrigeration
- Energy storage
- New technologies
- Why include transportation technology?
- LED streetlights
- Building envelopes
- Better differentiation between existing and new building application
- Application in AB – climate conditions

Table 3

- Practice: Energy audit – Green for All
- Retrofitting versus new construction
- NEST Model – feedback (gamifying), Real Estate Education
- Manufacturing (Codes & Standards)
- Standard practices
- Regulation around consumption
- Building envelope
- Lighting (passive solar illumination)
- Design features (efficient lighting)
- User friendly products
- Bill education/visuals/dashboard – mandate for companies to provide tracking tools

Table 4

- Energy performance contracts – financial mechanism to acquire these technologies
- Marketing – need a community mechanism to get the public involved/inspired – to see the behaviour change (create a brand)
- Industrial symbiosis programs (i.e. house program in NZ) – continuous improvement – it creates a circular economy – using someone else’s waste – reuse/investment.
- Commercial buildings – building recommissioning – performance (compared to baseline) – to perform as designed –reporting – actions. Maintenance/operates/owns
- Create a rebate for proven energy reducing technologies (vetted, validated, tested)
- Ports for recycled batteries (stations)
- Transit system – all encompassing (rural)
- Rail – repurpose for public use
- High speed rail – Calgary/Edmonton
- Residential – expedite residential light upgrades (solar/LED)

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- Behaviour change – need connection and purpose/education between occupants/building operators, i.e. building automation controls. Reconnects back to the building recommissioning
- “Premier” has to lead this – role model
- Utility bill “value” reduction (\$\$ energy savings) – explain this in simple terms
- Relate this to insurance claims – natural events are more intense, i.e. wildfire, flood, tornadoes, hail – based on science – relate to health care costs (or avoid this and talk about the positive – what ill the planet look like in the future)
- Insurance rebates – sustainable technologies you adopt . . . of companies/ organizations/ groups/ who can deliver.
- AB Energy Efficiency Office staff look at other jurisdictions for how technologies have been done
- Create rolodex before implementation – ID the players

Table 5

- Smart real time metering/measuring (especially commercial buildings)
- Efficient control systems
- Information relay (manage what you measure)
- Geothermal energy exchange
- Light/daylight sensors
- Separate stream for education (cultural/behavioural/social)
- Start with energy process (staging) – key messages ‘gamification’ of energy efficiency
- Build more sustainability in, e.g. transparency in billing, data provision/sharing. What if \$\$ ends – can’t all be rebates + \$\$ incentives. Link the incentive to public disclosure – will be driven by the market (market norms). Good corporate citizens – drive the competitive nature.
- Have ‘transparency’ stream parallel to the ‘incentive stream’ – work of the Agency
- Labelling and other methods that don’t cost the taxpayer
- Mandatory to have labelling at point of sale (each time)
- Education for realtors
- Education for market transformation. Close link and communication among and between GOA proper and the Agency proper

Table 6

- Utilize accessible tools and information that already exists (start with web site, need follow-up face-to-face workshops with experts in all communities/schools). Face-to-face knowledge sharing and make it easy
- Use different media for different sectors, e.g. business tailored mechanisms, homeowners, etc
- Pilot projects – demonstrations for people to see/interact with case studies, etc. (talk to homeowner, open-access, e.g. eco-solar tour)
- Procurement policies in governments must demonstrate leadership
- Promote existing technology and practises that are successful and could be scaled up in addition to new technologies
- Rating system/standard that is understandable

What are the most important factors to look at to select the best tools & technologies? Can you prioritize these factors?

Table 1

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- (#1) GHG Reduction
- (#2) Sustainability of program – will it last once the incentive is removed? Design it to be self-sustaining
- (#3) Watts saved for dollar invested
- (#4) How accessible the program is to wide range of Albertans, e.g. urban/rural, number of citizens who can access, diversity of audiences (is it equitable), focus on strength of small communities (towns/First Nations – good place to pilot/trial)
- For dollar saved what is the local economic benefit?
- Has it spurred new jobs beyond the initial purchase?
- Administration of the program – is there existing infrastructure to build on (less cumbersome and costly)
- Definition of appropriate scale, e.g. heating for residential needs different technology as efficiency of building increases (provide guidelines for appropriate scale of technology)
- Check other jurisdictions to see approach for low-cost/high-impact
- May need programs that need to be full service due to impact it would have on key sectors where most needed
- Ways to make initial audit as easy and cost-free as possible (make barrier free) leading to easy “what’s next”

Table 2

- (H) Speed & Capacity to get to market
- (H) Build from/work with those with existing relationships (utilities, municipalities, etc. – better customer trust, e.g. Manitoba PowerSmart programs with good access & applicability)
- (H) Market transformation – will it lead to transformation?
- (H) Life Cycle Assessments – longer term view plus means to measure & verify, e.g. was it cost effective, impactful, etc. International measurement & verification protocol (international standard for EE retrofits). Look at cross-jurisdictional best practices. Cumulative impact.
- (H) Balanced portfolio – larger buildings versus remote homes, more expensive issues need to be addressed (less cost effective opportunities also of value) As new technologies evolve – needs to be considered (changes – cannot predict future)
- (M) Administrative ease of program – wishful thinking?
- (M) Ability to leverage other funds, e.g. federal government, private sector, household investment)
- (M) Energy Labelling
- (M) Jobs and economic impacts – including where the jobs are (can be very local)
- Building envelope improvements – most important over mechanical systems, etc
- (L) Mixing EE and CES – EE first & CES later

Table 3

- Provable (real)
- Baseline establishment towards benchmarking (public)
- *Resonates with public – simple (elevator speech)
- How to appeal to the public? *Monetary (incentives, e.g. long-term, low interest); free tools; homeowner protections; accessibility; personal footprint; GJ/person metric; taxes increase is a disincentive; luxury tax
- Long-term impact

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- “Boring” programs – thermostats, etc; are they still prioritized?; balance between low hanging fruit and impact
- *Cost Efficient/Effective (low up-front investment is important) – public administration
- Fair
- Government leadership

Table 4

- (#1) Which ones cost nothing/small or low cost
- (#1) Fast adoption of technologies
- (#2) Speed of rolling it out
- (#3) Education in short-term/long-term, e.g. develop curriculum, do more elementary education and youth education (e.g. plant gardens). In High Schools – dual credit programs with focus on careers in green economy. Using schools as model, e.g. grant programs
- (#4) “On grid” wind turbines
- Hit a wide range of demographics, e.g. high offenders, sectors. Needs to be adopted by everybody – in other ways that can support.
- Produce tools for people – hardware/software, e.g. user friendly apps
- First Nations – connection to the land – reconnect youth, e.g. alternative energies, sustainability, elder component – reconnect to environment/to the land (oral/stories). Education needed for more understanding of history/treaties. Sustainability – showcase collaborative effort as “off-grid leaders”

Table 5

- *Linking the incentive to the transparency – disclosure leads us to labelling, reporting/bills
- Cost sustainability – e.g. labels vs new fridge cost
- Most compelling action to the point that people will actually do it – do-ability, e.g. solar panels – can see it.
- A passive approach may work for some. Not wholesale. Active change right away – less you have to do up front may be more appealing with greater uptake.
- Continue to follow the best performers
- Don’t re-invent the wheel
- *Performance based energy codes/incentives. Keep it simple – have the “numbers”
- Better baseline info to support developing the “number”
- Remote methods (e.g. remote sensing) to monitor as appropriate, e.g. circuit meters
- Leveraging capabilities for funding and outcomes
- Easily replicated by all/many utilities
- Standardized energy benchmarking (where am I versus neighbours?)
- For commercial – high impact: ability for contribution towards market transformation
- Third party energy services (companies)
- Methods missing – innovation fund to catalyze

Table 6

- How easy to is it to replicate and maintain
- All ‘defining success’ metrics listed on p. 10
- Outcomes/success is measureable
- Performance of different options from energy saving point of view

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- Must offer something for all sectors, so is potential for all to participate (target sectors differently, marketing to general public that makes it easy, remove barriers for low income)
- Customize objectives/incentives for sectors
- Consider full impacts of various options – big picture sustainability – long-term, life cycle
- (#1) Cost effective
- (#2) Proven
- (#3) Economic impact and incentive cost plus GHS reduction potential
- Key message to panel – don't ignore broader issue of community design. Don't focus on one type of technology, choose based on performance – don't be mesmerized by 'new' technologies, i.e. the "puppies in the window".