

**Energy Efficiency Advisory Panel
Energy Efficiency and Education – September 16, 2016**

RAW NOTES

Exploring the Links Between Energy Efficiency, Schools and K-12 Education in Alberta

**Educational Practices in Energy Efficiency, Community Generation/Renewables, and Conservation
Not Mentioned in Presentations (post-presentation discussion)**

- Modernization of buildings – lightings, sensors
- Think about energy efficiency in guidelines with considering retrofits
- Start a discussion about it.
- Be solar ready
- Additional grants – e.g. BP grant for energy initiatives
- Energy monitoring
- Energy efficiency conference, youth summit
 - To share info and spark interests
- Develop relationships with construction industry and trades industry
 - Get students opportunities to do apprenticeships (e.g. working with wind turbine)
 - Get guidance from trades industry
 - Link with career pathways
- Support social justice projects:
 - e.g. living wall gardens supplying food banks, community garden plots
- Curriculum is the most important tool
 - Keep the links to energy and environment in the curriculum as the curriculum gets re-vamped
 - Branch climate change out into other parts of the curriculum (e.g. health, social, etc.), in flexible schedules
 - Professional development for teachers (teachers convention, others) – spread too thin
 - Assess students on how to collaborate, be creative – how does this happen
- Work with Alberta Teachers Association – allow for more flexibility for teachers for professional development, etc.
- Have a person within the school as a resource
- Show TED talks in school
- Have flexibility within the school day to teach/learn, not just within the time for the course.
- Provide central resources – filter to other districts
 - Central database for courses being developed (e.g. Local development courses (LDCs))
- Student leadership to come up programming
- Research papers
- Holistic education
- Society aspects
- Providing market information to teachers and educators
- Field trips and overcoming financial constraints
- Showing people how to write grants, providing capacity
- Encouraging partnership opportunities
- Enhancing science curriculum, communities
- Additional curriculum
- Utilizing and leveraging pilot projects (light sensors, new technology)
- Integrating teacher/public engagement

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- Hands on projects - Student led – enabling students to take the decision-making reins
 - Utilizing engaging tangible technology that students will use – do things that they want to do
 - They have to use these methods every days
 - Tie in with the lifestyle of the students
 - Inside Education and other teacher resources used for
- Career and technology foundations
 - New options program, where you can focus on natural resources - built a garden that grew some food
 - Flower beds, aquaponics, composting and recycling, indoor gardening
 - Being able to hear from other jurisdictions/school boards
 - Enables you to know the large-scale nature of climate change
- Combining grades/ages
 - Safe and caring learning environment
 - Parents had some fear that
 - Incorporating parents/community members as well
- In acknowledging which practices are the most important – make sure they are student-led and hands-on
 - Measurement before they start and after they finish
 - Giving them room and space to make mistakes. Providing them support so that there is ownership over the process – what do they want to figure out
- Ensure that there are actual outlets for creativity
- Make it flexible to appeal to each students individual desire to learn
- Also enable them to get recognition with their parents – which will drive future engagement
- Fundraising for solar panels, credits, creating a club – re funding going back into schools – what does the funding look like so that the autonomy - without funding coming back ‘too prescribed’. Recognize the uniqueness of each school and district. E.g., can’t put a prescribed solar program in place when there are too many trees or the roof is too old and not strong enough. Create a program that not one size fits all and that there are opportunities for local decision making. Ensure a wide range in the programs offered by the agency.
- Students have to show up during ‘flex’. Geothermal. Don’t just focus on solar but what about wind and water – hydro....look at more options and expand our thinking on approaches. Energy effectiveness, value of a method as a teaching tool. What would be the criteria for the various tools – criteria and weighting...are needed. Be clear on your outcome and pick the right tool.
- Other considerations besides strict energy savings. Is it a good teaching tool – learning should not suffer. Innovation attention vs learning opportunity. Generate learning across schools - analyze at the Board level – maximum shared learning and diversity of learning opportunities.... Look at the best learning and tech value for the money. A range of interventions at the Board level.
- Among high schools there can be competition. But look more at elementary and kinder – and high schools – creates a greater community. Gets you out of your comfort zone – creates friendships and mentoring. Include more than the environment.
- If the school board has a broader plan, then it allows schools to be more flexible
- Have ways to make the ‘less flashy’ ideas a learning tool
- Conditioning and re-enforcing - get outside rather than the doom and gloom – getting outside

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- A lot of what we saw today was extracurricular, learning about in hands on – in class learning – real world projects – in class – integrated across all curriculum – make it part of the curriculum, not extra.
- Connected energy conservation with the units in the curriculum – helps teachers to check off boxes, and yet students still have those real life problems/experiences. – hit that sweet spot.
- Industry expert feedback
- Took my students to Mars – how do we generate the energy we need – bikes generating energy, domes in the gym, Herman Chang – Hillview Schools
- Give illustrative examples and leave it open to the teacher – make pickles with the kids – from growing cucumbers.
- E.g., mock election with kids ‘made my mom vote’
- Kids brought home stickers for ecostation items
- Make it like remembrance day – everyone does a project – age appropriate
- Integrate and weave this topic through all aspects of the curriculum – math, gym, everything.
- The Company Program – build a company – and put in all these incentives to be as green as possible – in the end we all get paid – and you have to donate charity.
- Bring back the programs that get elementary students get outside and seeing nature in the community i.e. outdoor education. With more funding for them.
- Put windows in the buildings that can open and are energy efficiency and bring in natural light. More funding or light sensors.
- Students need to feel connected to nature and get outside. Do more field trips
- Introducing environmental literacy courses in grade 12 is too late – introduce it in the curriculum earlier on, as well electricity.
- Make sure all schools are given funding to keep it fair for energy efficiency education and programming so all the kids get the same opportunities.
- Climate change specific related outcomes in the environment curriculum
- Professional development for teachers should include the many values and cases for energy efficiency – more sharing among teachers
- PD should be meaningful and quality – use a consultant and make it practical to share what is going on and how to implement projects – make it more integrated learning and outcomes – don’t talk/present to teachers and leave
- QE should be a leader and model how other schools can be green – help the teachers become more knowledgeable about the subject matter
- “Living classrooms” – Outdoors spaces that use the natural environment for instruction.
- Installing renewable generation that can run basic functions in schools. For example, a small solar panel that runs a water fountain.
- Student-created proposals for potential longer term projects – 5 years.
- Building upgrades such as motion sensors for lighting.
- Using the building itself as an instructional tool.
- Incorporate energy efficiency into the curriculum.
- Government grants for projects.
- Allowing students to monitor the energy use of their schools. Examples: placing the meter in a public space, smartphone applications.
- Included energy efficiency in professional development.
- More flex time for teachers to allow them to take on energy efficiency instruction.
- Educating schools boards regarding energy efficiency.

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- Modernization of buildings – lightings, sensors
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What are the barriers to achieving the vision in which schools’ energy efficiency practices and community energy systems technology – and student learning, competencies, and actions – are interwoven? What bridges must be built to overcome these barriers? How might Energy Efficiency Alberta help?

Barriers	Bridges	EEA Role
	Changes to the curriculum	
	Coordinator to coordinate across schools	
	Have grant application programs that you apply to be based on what. Have programs be accessed optimally by schools. A Committee or something to triage	<ul style="list-style-type: none"> • A specific piece of the budget for education and outreach – societal benefit – engaging. • Each program has an educational component – so there are two ways to access funds to advance Env/Energy Efficiency education.
A curriculum that incorporates all subjects and allows flexibility is essential, and should allow students to graduate. These should be interest-based student centred program – less siloed class structure. You could still provide an all-encompassing science class that addresses the connections to post-second. Timetabling and university entrance is still a factor.	<ul style="list-style-type: none"> • Using existing forums and using conditional grants, support the following <ul style="list-style-type: none"> ○ ATA • AB Regional Learning Consortium • Annual conference for teachers – connecting with colleagues, students, school district reps, trustees and mentors – all stakeholders 	
Access to expertise and funding for teachers	Create a database of experts resources and access to project coordinators and consultants (they should be teachers) that can deliver EE courses	Work with ACEE and Inside Ed to create and manage this and let folks know the info is there
Adoption of tech and practices in all schools – maintenance, custodial...all these staff need support. Not everyone is an EE expert		<ul style="list-style-type: none"> • Have a support group from the agency – loan specialists into institutions • Embed someone

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Barriers	Bridges	EEA Role
Alberta Teacher's Association is largely reactive in their approach	Sustainability policy, long term planning.	Educative function to increase awareness
Apprehension around liability. Field trips. Bureaucracy.		
At the school board level—funding. It's difficult to ask for energy efficiency learning content if other content would need to be sacrificed.		
Attitudinal – teachers may say 'that's not part of my subject' – overcoming the mental block of this		
Cost – funding is always an issue so that students are able to accomplish their work. Sometimes just getting computers is difficult – let alone specific equipment <ul style="list-style-type: none"> ○ Exploring ways that are viable to identify funding that are available in a sustainable way ○ The savings from the students initiatives could be redistributed ○ A teacher that is a project coordinator who has a ½ FTE would be able to carry this through to completion. This could help teachers collaborate and share ideas within a school division ○ Alberta initiative for schools improvement was a relic of how this funding model worked. 	Programming should be sustainable and long-term <ul style="list-style-type: none"> ○ Multi-year programs are typically more long-lasting and effective Should have strict requirements – some portion of those industrial school facility savings should go back into student-led programming	
Curriculum is overloaded and putting a barrier on students and parents	PD for teachers – Energy Efficiency Alberta could come out to professional development conferences	
Curriculum is too heavy for teachers to be free to do more discovery	needs to be more discovery learning than delivery -	Need to change the curriculum to include sustainable development and include energy efficiency
Each district has different policies e.g., risky play. Some are more flexible, relaxed. This impacts what projects and opportunities can be done. Can we streamline some of these cumbersome policies – how to work around/through/streamline.	School boards putting their heads together. Shadowing others who are less risk averse and how that works. How did they get to that point?	
Energy efficiency/renewable technology is not visible enough	Utilize webcams/ education resources	Ensure capacity is available to support educational

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<ul style="list-style-type: none"> • Every student thinks in different ways – need to see what they’ve done and their progress – IN THE WAY THEY NEED TO SEE IT. LOCAL AND GLOBAL TOO. • Another: Barrier is more apparent in elementary school than high school. Making sure the parents are aware and knowledgeable – is more of challenge • Contending priorities. • Look at the relationship between the green funding raising methods – e.g., bottle drives 	<ul style="list-style-type: none"> • A dashboard that shows all schools. Knowing where you are able to improve. • Solution is partnerships and it takes a village. 	<p>opportunities/school level capacity</p>
<p>Financing – it gets pushed to teachers, school system</p>	<ul style="list-style-type: none"> • Funding for innovative projects or for projects within the curriculum, equipment • Funding for building modernization – visible projects in communities that can be used for education purposes 	
<p>Funding for programs – having to rely on parents, PACS</p>	<p>Creating a funding body</p>	<p>Certain % gets sets aside for outdoor education programs for schools that are under funded</p>
<ul style="list-style-type: none"> • Inflexibility in the schedule • Project based learning is difficult for junior and high schools, in larger schools 	<ul style="list-style-type: none"> • Changes to the curriculum • Competency, creativity based, etc. 	<ul style="list-style-type: none"> • Get involved in the curriculum re-design. • Link in with Advanced Education (there are stakeholder consultations occurring) (there are stakeholder consultations occurring)
<p>Information transfer</p>	<p>Central kits for a particular unit that can be borrowed, lots of kit already out there</p>	<p>Repository of information (pulling from multiple places, teachers conventions, etc.) – maybe not. There are a lot of repositories</p>
<p>Infrastructure challenges</p>	<p>Retrofits, audits, link it to</p>	<p>Provide energy audit</p>

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Barriers	Bridges	EEA Role
	student involvement	toolkit to every school
Keeping up to date and current o Exceptional amount of information makes it impossible to keep it current	The Agency could utilize an outreach role in schools and communities to help measure energy consumption and prop up small scale renewables	
<ul style="list-style-type: none"> • Knowledge • BC Climate Exchange – started in 2002/03 that empowers students to actually learn on their own with technology • Provides frameworks so that students can learn on their own • Inside Education and Green Learning.ca • Learning for a sustainable future 	Agency could work with students and facilities – where behavior change is front-loaded in implementation	
Lack of capacity	More collaboration between government and education sector	Ensure capacity is in place to support school programs/technology deployment
Lack of funds to support school programs	Provide direct funding for teachers to participate in programs	Ensure resources are made available
Lack of professional development for teachers	Provide grants/funding for professional development	Ensure financial support is available for school system
Lack of qualified teacher	Professional development that incorporates energy efficiency.	
Liability, security and transportation to achieving out of classroom experiences	Have a standard fund or insurance and security plan for students	<ul style="list-style-type: none"> • Special insurance fund established for school boards • Help the school boards flush out the risk of taking students outdoors • Need a special allocation for transportation – tie it back to insurance
Overloaded curriculum and maybe not much room to take on time consuming projects. No time for this in our 'regular' classes		<ul style="list-style-type: none"> • The agency should have a youth advisory council. • Students need to be better informed. Good speeches, speakers,

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		presentations, posters <ul style="list-style-type: none"> • Students need to communicate with students.
Planning time for staff		
Private funding	Teachers can access for funding	
Project based learning is difficult for junior and high schools, in larger schools	Changes to the curriculum	<ul style="list-style-type: none"> • Get involved in the curriculum re-design. • Link in with Advanced Education (there are stakeholder consultations occurring)
Red tape/internal bureaucracy	Allowing more autonomy in at the school level	Providing programs that can provide direct funding to schools
School boards don't understand the whole picture of energy efficiency.		Provide support to school boards
Solar panel damage, maintenance and the costs of replacing. So expensive		Practical areas of funding by the agency.
<ul style="list-style-type: none"> • Students don't recognize the implications of their energy use. • Student energy efficiency literacy. 	<ul style="list-style-type: none"> • Energy audits at schools • Students should have the opportunity to create energy • Student participation 	
Teacher buy-in		Inspire teachers to use the kits (e.g. Inside Education programs) – make it meaningful
Teachers don't need to be experts – just facilitators	Allow them more time to explore this – work with outside consultants who work in this area. – leverage existing expertise (Innovate, Telus Spark)	Work with school boards
The word climate change has a negative connotation	Change to environment sustainability	Tie energy efficiency education to the values of the audience
Time to collaborate <ul style="list-style-type: none"> ○ Some districts can apply for release time, but that makes students ○ Summertime PD could be useful as most teachers already volunteer their time. 	Knowledge bank for resources and information <ul style="list-style-type: none"> ○ What other schools are doing 	

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<ul style="list-style-type: none"> ○ An opportunity to collaborate with other teachers during this time would be helpful ○ Students have another matriculation priority classes <p>University entry requirements are a factor – some institutions don't recognize these innovative classes</p>		
<p>Using the money in classrooms instead – immersive curriculum</p>	<p>Reallocation of funding</p>	<ul style="list-style-type: none"> ● School boards are encouraged to look at classrooms for where the money can be allocated – work with teachers. ● Look at funding and getting teachers to understand energy efficiency

Session Wrap-up Discussion

- Keep autonomy of schools
- Get more done without limitations, barriers
- Hands-on learning experiences for students – field trips and projects, building, doing
- Pilot projects – geothermal, solar. They can then be an example
- Make energy use visible to students – have a webcam on the energy metre
- Professional development for all teachers, that is meaningful
- Dedicated flex time in morning to work on environmental projects. Doesn't take away from day-to-day curriculum
- Reconnecting with nature and environment, motivate from a positive point, not guilt
- Make it easy for the teacher
- Energy literacy needs to start early
- Make energy literacy a part of the core curriculum
- Establish a fund for teachers, consider equal opportunities
- Model energy efficiency in our schools by dealing with infrastructure, things that are visual (monitoring, solar panels)
- Funding to support setting up panels (back end)
- Funding for coordinators
- Funding for projects – driven by students, champions, teachers
- Make sure EEA has a seat at the table when re-designing curriculum
- Curriculum
- Sustainable funding
- Participatory learning. Students and teachers emphasize the need for hands-on projects in learning about energy efficiency.
- The youth need to be empowered with opportunities.
- Students devising solutions to energy inefficiency.

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- Students, teachers and school boards have an insufficient level of energy efficiency literacy.
- Projects that allow for exposure to industry and advocacy.
- There are not enough qualified teachers to offer instruction on energy efficiency.
- Students should be encouraged to change the environment in which they learn.
- What/Where/How students learn needs to be changed.
- Lack of financial resources for teachers. Often, they need to fund their own programs/projects.
- Pilot projects and using schools as models of implementation.
- Physical buildings become tools for learning.
- Students should have opportunities to monitor energy use.
- Intersection of environment with other topics.
- Student exposure to projects in the real working world.
- Some of the school programs/projects utilized partnership with community entities.
- General lack of funding in the education sector regarding energy efficiency/environmental learning content and support resources.
- Sustainability progress.
- Importance of the learning space.
- School boards require incentives.

As you leave here today, what final key message do you wish to leave with the Energy Efficiency Panel? (handout cards)

- Promote the importance and significance of behaviour change (conservation = most cost effective approach) along with retrofits to school districts, teachers, students so their projects are integrated strategic and sustainable (as well as viable)
- Involve students (advising committee) in each step of the process along with all the stakeholder engagement to design a strategy
- When working with facilities at school districts, ensure that data is collected, shared, accessible to students, especially students “leading” projects in their school, AND ensure that school districts SHARE a portion of the savings to all schools participating. (Make the shared savings equal and not scaled according to actual savings because some schools have buildings that limit the savings vs others)
- When designing a strategy, develop mechanisms and systems (support and equipment) to ensure rural schools can participate virtually and/or offer financial support to ensure level playing field for access to same expertise and programs
- Multi-year participation
- School district commitment and on the ground involvement
- Have a school district point person to rally, promote and support schools
- Build on existing programs and expertise (don’t reinvent the wheel – make it better).
- The Alberta Climate Change Office and Energy Efficiency Alberta should consider:
 - Establishing a “one-stop-shop” source of funding to which schools and school boards can submit requests for grants
 - Developing professional development opportunities for teachers – partner with the Alberta Regional Professional Development Consortia (www.arpdc.ab.ca) develop materials and workshop facilitation/facilitators and provide a grant to ARPDC to organize and offer the sessions.
 - Participating in AB education’s development of New curriculum

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- Establishing an energy efficiency expert group to assist with building capacity in school districts. Re: adopting and incorporating energy and efficient technologies and practices.
- Please support our schools and colleges so that they can do exciting and ground breaking sustainable energy projects with their students.
- The rate limiting steps in transitioning to a low carbon society is education. It is in institutions like Queen Elizabeth where entrepreneurs, innovators and environmental stewards are inspired.
- Competitive, but continuously open fund (based on Carbon Tax Revenue) where schools can have access to resources for energy efficiency cap ex. — investments in a sustainable future which also function as a learning opportunity.
- Non-profit organizations already working to bring energy literacy and efficiency into school classrooms should be a primary resource in the programs the agency might recommend or support. These organizations have expertise and community connections already established alongside excellent programming.
 - Communication is key *Knowledge is power
 - Parent advisory panel (they make decisions about education and they pay taxes)
 - Local decision making
- I think funding will be a huge barrier and you should create a grant so students will be motivated to lead their projects. To advertise, you should talk to the leadership teachers to get students involved. Also high schools can partner with elementarys as they both can be big problems.
- Get kids outside, hiking, playing, swimming
- I think hydroelectricity would be very beneficial for a power source and having more classrooms because classes can be very full form time to time.
- Alberta is the leader in energy education in Canada. Supporting organizations and individuals already working in this space is crucial. New and Shiny is great, but there is already a lot of work that is ready to scale up.
- I hope that with the ideas shared by people, we can get inspired and maybe find a new way to make a difference. Hopefully we can get more people aware of the cause and have them give their thought on this, students and adults.
- Please support schools by incentivizing climate change fighting technologies being used in schools and providing support for teachers (and funding) to incorporate this meaningful into classrooms.
- Give teachers time and training to help students make connections to energy conservation.
- Fund a .3 position for each school.
- Change science curriculum to include Environment Conservation in every grade.
- Promote Genius Hour and PBL in every school.
- Consider the whole system – you have your mandate, but we don't act/exist in a bubble
- Be cognizant of our educators time, resources and passion for the topic
- Consider how to create connection to the issues to create action.
- Help teachers to feel confident in leading a sustainability course or club
- There are many possible ways to do this:
 - Funding/grants
 - Resources
 - Direction towards existing resources
 - Professional Development
 - Flexible hours/schedules
 - Work load recognition

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- This work is important. Short term costs are of minimal consequence to the long term integrity of humanity's legacy.
- Education is the way to create a social movement of environmental responsibility!
- Support teachers and students in getting involved
- Funding initiatives, not just school board down but student up – student voice in school boards
- Teacher professional learning – energy efficiency coordinator in school divisions and bunch them together to connect with each other and experts
- Recommend in curriculum development across all grades and subjects and cross curricular
- I would love to express to the panel the importance of exemplary pilot projects, and funds on student learning opportunities. These allow students to have a full understanding of climate change and energy education, as the youth are the climate leaders of tomorrow and have a lasting impact on the lines of other students and the larger world around them.
- Present best practices to school boards across the province. Get admin and trustees on board.
- Make a commitment to ensuring sustainability, especially in schools which should be models for sustainability.
- Make a firm, unconditional commitment to environmental sustainability and be prepared to support good ideas and enthusiasm brought to the issues by regular people.
- Leverage existing resources (teachers, NGOs, etc.) Make sure that this is an economically sustainable endeavour.
- Move away from climate change (too controversial) and your angle should be environmental sustainability through a direct connection, link, and love of nature and our environment. Students, young and old, need to relearn how to live off of and with the land. (i.e. canning, gardening, growing and maintaining ecosystems, and maintaining our clean air)
- Within schools enabling a designated time towards education plans so youth are aware of environmental issues. Not treating the environmental science section as an extra or optional part.
- K-12 Education is the way to transform our future into a sustainable one and teachers will need support through:
 - Curriculum redesign
 - PD opportunities for all teachers not just science teachers
 - Sustainability of funding that is ongoing not annual
 - Resources to keep abreast of new technology and information as well as community involvement
 - Work closely with AB education to consider innovations and to stay abreast of what is happening at the ministry to enable changes to occur where they fit best and support the integration of the work of our two ministries.
- Thank you for taking the time to listen. These open communications with students need to be sustained. Kids will tell you what they want; teachers can help make it happen. Let's find a way.
- Provide support – financial, resources, expertise— to enable the exceptional on-the-ground work being done by schools and school districts to move toward a sustainable future.
- Being involved in curriculum redesign. Important voice to tell what students should know when they “enter” adult society. Support teachers with energy efficiency now. Support via trading resources, expertise, and information.
- We must model energy efficiency in our schools both in retrofits and new construction. Program should be highly visible and interactive with students.

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- Need to find a way to inspire/encourage people to care about environmental education. Kids especially in small communities lack funding/inspiration to find ways to promote a positive change in their communities.
- The student voice matters
- Keep it at the forefront, rally the school boards and bring it up as a key initiative moving forward. Emphasize the importance of environmental education at all levels, beginning in kindergarten.
 - The importance of equal funding opportunities for all schools around energy efficiency
 - If possible, to influence curriculum to support energy literacy in all grades and subjects.