ALBERTA YOUTH WHITE PAPER ON WATER CONSERVATION

CGE
THE CENTRE FOR GLOBAL EDUCATION

Inside education

Alberta Government

TakingITGlobal
INSPIRE INFORM INVOLVE

Overview

On May 21st, 2014, over 250 students from six high schools across Alberta, in partnership with Alberta Environment and Sustainable Resource Development and Inside Education, came together to collaborate, through the use of technology, in a Virtual Town Hall to discuss the youths' vision for the sustainable development of water and its conservation in the province. From the rural community of Caroline to downtown Calgary, from Medicine Hat to our province's capital, Edmonton, the youth of Alberta came together to exchange ideas, debate alternatives and ultimately create a document that represents their voice on Water Conservation. The Virtual Town Hall, called an "archetype of grassroots democracy" by Senator Grant Mitchell, was the culmination of over a month of online teamwork, 1500 hours of student collaboration, over 100 hours of teacher facilitation, and a passion by Alberta's youth to engage in the water conversation and development debate and have their voices heard.

In the month prior to the Virtual Town Hall, student leaders, systematically chosen from each school to represent Alberta's diverse geographic and demographic population, met on a weekly basis to exchange ideas, work with Alberta Environment and Sustainable Resource Development, listen to experts and create a common framework based on the provincial Water Conservation, Efficiency and Productivity (CEP) Plan. This framework would be the basis upon which their fellow students would be able to identify challenges facing the province with respect to Water. Concurrently, the students were trained on how to use an arsenal of Web 2.0 tools (YouTube, Twitter, cell phone voting, Google Docs, H.323 Video Conference, discussion boards, blogs, etc.) to collaborate, build consensus and create community regardless of time or location.

Equipped with this knowledge and empowered through 21st-century technology, the student leaders facilitated a full day virtual town hall. In the morning, they led 250 of their peers through a dialogue with local and international experts. In the afternoon, the students worked in breakout groups to address three critical questions:

What initiatives should Alberta pursue to ensure sustainable water resources into the future from the supply side?

What initiatives should Alberta pursue to ensure sustainable water resources into the future from the demand side and what role could the CEP plans play?

How do we engage our schools, our communities and our province in the initiatives that this white paper will suggest to government?

They applied these questions to the four provincial sectors that consume the largest amount of water: Irrigation, Upstream Oil & Gas, Power Generation and Urban Municipalities. The data collected in response to these questions was synthesized into a survey which was, in turn, made available to be voted upon by the 3000+ students in the six represented schools.

This document, Alberta Youth Water Conservation Strategy: A White Paper by Alberta's Youth, written by a committee of students, is the direct result of that process. The evolution of the document involved equipping leaders with knowledge and technology, having those leaders facilitate a larger conversation among their peers, taking the data generated to their community at large for feedback and direction, and then synthesizing the results in the student white paper. It represents the voices of thousands of youth, introduced to the complexity of water in Alberta, unified through the power of 21st century technology, and sharing a passion to contribute to the dialogue taking place on the future of Alberta and water.

Irrigation

The irrigation sector is the largest consumer of water in the province, consuming up to 42.5% of the water taken from the province's water basin. The youth of Alberta recognize the importance a sustainable water strategy has to the future of the irrigation industry. To ensure this future for the generations to come, the youth of Alberta make the following suggestions:

1. The agriculture and irrigation industries increase efficiencies in water usage.
2. Farmers modify their current crops to provide for efficient water usage in the future.
3. The government ensure equality with regard to licensing and allocation in irrigation.

Although the youth of Alberta recognize the great work that the Alberta government is doing to increase the efficiency of water use in the irrigation sector, they believe that more work needs to be done. The irrigation sector is already using incentive programs to help achieve the goal of having over 70% of all irrigated lands using best management practices in order to reach CEP targets. One of the desired outcomes identified in the Water for Life Strategy is that the overall efficiency and productivity of water use in Alberta should be improved by 30 per cent from 2005 levels by 2015. The youth of Alberta feel that this is such an important strategy that the objective should be greater than 30%.

Given the significant efficiency challenges faced through the use of old technologies, the youth want to encourage the implementation of new technologies through the use of incentives, education, and voluntary and compulsory programs. From the placement of moisture detectors linked to a pivot system that can be turned on or off according to the soil moisture levels to the pressure drop tube system to wireless technology that allows farmers to control water application from a home base or cell phones, the youth believe the government needs to play an active role in encouraging the transition throughout the industry. Although the youth recognize that the government is currently actively encouraging farmers to make the transition to new, more efficient technologies, they believe that a stronger public and farm education program balanced with incentives and, in some cases, compulsory changes needs to be put in place.

Another issue the youth believe needs to be addressed is the issue of water seepage through transportation pipes and canals. The amount of water lost through leakage through existing pipeways and canals needs to be reduced. As per the Alberta irrigation CEP, the government has undertaken the ongoing initiative to replace 2,000 more kilometres of canals with pipelines.[1] The youth believe that the funding should be continued now and into the future.

The youth of Alberta believe that farmers should change and modify their current crops to provide for a more efficient use of water in the future. The youth feel that farmers who access water from the irrigation districts need to choose crops that are water efficient and yet at the same time serve the required purpose. An effective yet perceived harmful solution is the use of GMOs (genetically modified organisms). The youth of Alberta feel that although GMOs are a possible solution, they need to be strictly monitored to insure their safe implementation.

The youth of Alberta would like to acknowledge the wonderful cooperation and teamwork among the agriculturalists, displayed during the previous drought season. Farmers used good stewardship and cooperation to help one another with their concerns of water scarcity during this period of great difficulty. The present allocation system works if there is a culture of cooperation and teamwork as mentioned in the above example. We recognize that current conditions are applied to license holders; however, to ensure equality, the youth of Alberta suggest that the FITFIR (First-in-Time First-in-Right system) be reevaluated. "The FITFIR system is largely based on volumes and blind to seasonal supply."[2] The youth recommend using the percentage system, based on available flow, to allocate water instead of designating specific quantities to the licence holders. The youth feel that this would provide the province with a more fair and equitable system. The youth strongly encourage shared governance and giving out equal licences to all licence holders.

[1] http://www.aipa.ca/wp-content/uploads/2013/11/AIPA-CEP-Final-Version-1.pdf

[2] News Brief Environmental Law Center, Vol. 24 No. 4, 2009 Pages 5-7, Who's it "FIT FIR"?, Provincial allocation review looms large for water users and the environment, By Jason Unger

Power Generation

Critical Question: How can the Government work towards conservation and efficiency in reference to water within the power sector?

The youth of Alberta recognize that power is vital to the quality of life of citizens within Alberta. In order to ensure that the processes by which people obtain power allow for a sustainable future for water in Alberta, the youth recommend that revisions be made to existing methods, technologies, and monitoring systems within the industry through the assistance and support of the government. The youth of Alberta recommend the following to the government of Alberta:

1. Endorse new technological advancements and retrofitting within the power generation industry.
2. Encourage the development of more water efficient power generation.
3. Implement further monitoring systems and improve transparency.

The youth of Alberta believe that the government needs to establish the conditions necessary for needed upgrades and technological advancements to further the progress towards improved efficiency. The government should endorse programs of awareness and provide funding for research to advance and promote alternative technologies within the thermal power generation sector particularly in cooling systems. The youth are aware that initiatives exist for other environmental conservation efforts such as the carbon tax on carbon dioxide emissions released by industry. Such taxes could be introduced to reduce the amount of water consumption within the sector. The money from these taxes could be put towards research efforts for water conservation and the development of new technologies.

Building new infrastructure can be costly and involve an initial increase in water use during construction, but new technological advancements need to be retrofitted into pre-existing structures to lessen water use and consumption. Similarly, the CEP plan for 2012 calls for the retirement of "higher water consumption generation technologies" and to "improve the current cooling processes"[3]. The shutdown of Wabamun coal-fired power plant over the last five years (from 2012) is one such initiative aligned with the CEP goal and youth believe that further action should be taken in this area. In accordance with the earlier points, initiatives could be created to encourage the placement of new technologies in the power sector. Through tax incentives, subsidies or grants the government could assist with financial strains that come with implementing new, more water-efficient systems. Reutilization is one of the most prominent suggestions of Alberta youth since grey water could be reused within the plant or the water could be diverted to a different sector. This technique is already being employed.

Youth have voiced that alternative energy resources should be explored in accordance with one of the CEP plan goals that "higher efficiency forms of generation" should be utilized. Youth believe that initiatives should come from the government to encourage the development of new infrastructure outside of techniques already established. The further utilization of natural gas and the new technologies within this portion of the power sector that are more water-efficient would assist in the water conservation effort. Most notably, creating solar and wind power generation stations in Alberta was mentioned as a solution to the water problems of existing infrastructure. It would take water to build these facilities, but in the long run, they would greatly diminish water consumption in the province.

Finally, the youth believe that the government should work towards promoting high standards of water management in the power sector, improving on existing monitoring systems and public transparency when it comes to encouraging the reutilization of allocated water. The young people of Alberta recognize that monitoring systems and corresponding consequences exist but wish to ensure that everything is being done to ensure water efficiency. A large percentage of youth voted that stricter regulations need to be enforced and communicated with the public when it comes to water conservation. Along with industry programs, youth believe that within municipalities, education and awareness campaigns should be instigated for the sake of active involvement in this area of society.

[3] http://environment.gov.ab.ca/info/library/8682.pdf

Oil and Gas

The youth of Alberta recognize that the oil and gas sector is central to the economy of the province and as the fourth largest consumer of water in the province, a strategy for the sustainable usage of water is critical. In order to increase water conservation and water quality, the youth of Alberta recommend the following:

1. Increase the development of new technology to improve the recycling and reuse of waste water in the recovery and production of oil and gas.
2. Allocate financing to new oil recovery and extraction technologies.
3. Increase accountability for accurately monitoring, reporting and communicating all water usage and quality concerns.

The youth of Alberta recognize the oil and gas industry is expected to grow substantially in the coming years, and the demand for water to be used in this sector will also increase. Alberta youth have raised concerns regarding the sustainability of various surface and groundwater uses. The youth of Alberta believe certain initiatives should be implemented regarding the development of new technology to improve the recycling and reuse of waste water from waste water treatment facilities and tailings sites in order to assist the recovery, extraction and production of oil and gas. A strong emphasis on cross-sectoral use of reclaimed water needs to be implemented so that the oil and gas sector utilizes waste water in place of surface and groundwater. An example of this is the Gold Bar Water Treatment Plant Industrial Water Reuse Project. Suncor designed and built a 5.5 kilometre water pipeline that links Suncor directly to EPCOR's Gold Bar Wastewater Treatment Plant. Gold Bar has also developed multiple treatment options to make water viable for other uses such as snowmaking at the Sunridge and Nordic ski clubs. The youth recognize the issue of geographical location of treatment plants and oil and gas operations; however, it is recommended that efforts continue to link water reuse and recycling between sectors.

Alberta youth recommend that oil and gas companies increase accountability for accurately monitoring, reporting and communicating all water quality and usage to stakeholders. Given that the industry is perceived by many communities as being responsible for the majority of water quality issues that impact the environment and public safety, the youth of Alberta recommend more effective methods of communication, public reporting and accessibility of information. In turn, this will increase transparency within the oil and gas sector and manifest trust in the people, especially the youth, of Alberta. The youth are aware that public safety and environmental protection are top priorities for the Government of Alberta, and that rules and requirements are enforced while keeping in mind economic prosperity for all Albertans; however, there are examples where incidents have occurred and people have been left uninformed about how water conservation and quality are being monitored. For example, in Wheatland, Alberta, a landowner alleged that Encana fractured a freshwater aquifer, causing well water to be contaminated with dangerous concentrations of methane and other toxins, which led to a court challenge. To avoid situations like "Encana versus Ernst" arising again, steps need to be put in place to minimize the negative consequences that could come from lack of exploration planning, monitoring and reporting to the people. The youth advise that monthly government inspections be completed to look over methods used by companies to ensure environmental and public safety. These monthly government inspections should be mandated and occur on a regular basis. Not only would this create a safe and open dialogue between Albertans and all oil companies, it would also create job opportunities for Albertans. This is something that should be encouraged and supported by the government as recommended by the youth of Alberta.

Urban Municipalities

The youth of Alberta recognize that in order to sustain a growing urban population, changes need to be made in the ways we handle water on an individual, municipal, and provincial level. As of 2009, the reported residential water use per capita per day was 395 litres; this indicates the significant efforts that will be required if the goal of 195 lpd by is to be met by 2020[4]. To ensure the continued quality and quantity of water in Alberta, the following initiatives have been recommended by the youth:

1. Increase water costs in Alberta.
2. Improve infrastructure.
3. Find alternative water sources.
4. Institute rebate systems.

The youth of Alberta believe that the government needs to consider the price of water in the province. It is our recommendation that the price of water be increased, and either a water meter or increasing block rate system[5] be made standard throughout the province. It has been clearly shown that increasing the price of water decreases water withdrawal per capita[6]. The youth of Alberta recognize the Alberta Urban Municipalities Association's (AUMA) concern of a negative spiral in which increasing costs and resultant conservation initiatives may cause a loss in revenue at a time when municipalities are in need of funding to upgrade and maintain infrastructure. This in turn may leave them unable to fund water treatment facilities and infrastructure. However, when examining the price of water in our sister countries in relation to their usage, it has been proven that a balance of higher price and lower consumption can be achieved[7]. In addition to the increase in cost, the youth of Alberta believe that conservation-oriented rate structures should be established throughout the province. The increasing block and mandatory water meter system can achieve up to 70% lower per capita water use when compared to a flat rate[8], and go beyond by rewarding those with reduced water consumption. Ultimately, "[u]nrealistic water rates undermine any efforts to reduce water use by encouraging wasteful water use, artificially increasing demand, and providing little incentive for efficiency improvements, often leading to overcapitalization of water systems that are not financially sustainable."[9]

Another key issue the Alberta youth have recognized within our province is the infrastructure that deals with our water supply. In 2009, Environment Canada estimated that 10.1% of water from municipal systems across Alberta was unaccounted for[10]. This water is valuable; it has already been treated at taxpayer and government expense and is being lost due to our failing infrastructure. The youth feel that reviving this aging infrastructure can mitigate the loss of this expensive resource and is in line with the third goal in the AUMA's CEP plan, to "complete a water audit and identify ways to reduce leaks."[11] In addition to repairing existing problems, in certain municipalities the youth have also suggested creating a reservoir system accessible by our cities. These reservoirs would be able to contain excess water during wet seasons to avoid flooding, and serve as a supplementary source of water during the dry seasons. Correcting water loss and increasing water containment capacity are what the youth feel represent the greatest opportunity for municipalities to conserve water.

In order to lessen the demand on conventional water supplies, the youth feel that encouraging alternative sources is a necessary initiative that needs to be pursued. The youth have identified secondary sources such as grey water recycled within households and collected by rain barrels. Newer housing developments should be built to revised standards, in which wastewater is collected from certain household appliances in external containment units that can be used

for various outdoor uses[12]. This reuse of grey water reduces our withdrawal of treated water and minimizes the amount sent to costly treatment facilities. The youth also advised implementing rainwater catchment methods such as rain barrels or rooftop precipitation collection. By allowing individuals to take advantage of collected rainwater through these means, the potential for water conservation in regards to outdoor uses is tremendous; this supply could even be utilized for various household appliances that do not require potable water. This direct correlation to the fourth CEP goal as established by the AUMA, "to promote the adoption of water efficient fixtures and technologies"[13] further shows the importance of this recommendation to both the youth and municipalities.

The youth strongly believe that the Alberta government needs to take an active role in encouraging citizens to invest in conservation-oriented technologies through rebate programs and tax incentives. These programs would provide motivation to further increase knowledge of personal water use and stimulate a shift towards water-preserving mechanisms. These would encourage and reward those who have furthered the efforts of conservation by utilizing low-flow toilets, low-pressure faucets, and the techniques outlined under our previous recommendation to provide alternative water sources. The youth recognize the success of tax incentives and rebate programs already in place throughout the province, such as the Residential Toilet Replacement Program in Calgary[14], which, since its inception in 2004, has saved over a billion litres of water[15]. Compelling Albertans to strive towards personal stewardship through instigating water-preserving technologies is essential if the AUMA's goal of 195 litres per capita per day is going to be achieved[16].

[4] http://water.auma.ca/digitalAssets/3/3111_AUMA_Renewed_CEP_Plan_-_Targets_and_Actions__Draft_May_2014_.pdf

[5] This is a system that increases the amount paid for water in a step-wise, block, manner.

[6] http://ageconsearch.umn.edu/bitstream/19945/1/sp04sc11.pdf

[7] http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1

[8] http://www.google.com/url?q=http%3A%2F%2Fwater.auma.ca%2FdigitalAssets%2F2%2F2686_Planning_for_Water_Conservation_and_Efficiency_-_A_Handbook_for_Small_Municipalities__4_.pdf&sa=D&sntz=1&usg=AFQjCNHp3PXd92tJjhvF2EQ4gW6hhTUhYw

[9] http://water.auma.ca/digitalAssets/2/2686_Planning_for_Water_Conservation_and_Efficiency_-_A_Handbook_for_Small_Municipalities__4_.pdf

[10] http://water.auma.ca/digitalAssets/3/3111_AUMA_Renewed_CEP_Plan_-_Targets_and_Actions__Draft_May_2014_.pdf

[11] http://water.auma.ca/digitalAssets/2/2686_Planning_for_Water_Conservation_and_Efficiency_-_A_Handbook_for_Small_Municipalities__4_.pdf

[12] http://guelph.ca/living/environment/water/water-conservation/greywater-reuse-system

[13] http://water.auma.ca/digitalAssets/2/2721_AUMA_CEP_Plan_-_Interim_Report_to_AWC.pdf

[14] http://www.calgary.ca/UEP/Water/Pages/Water-conservation/Indoor-water-conservation/Toilet-rebates/Residential-toilet-replacement-program/Residential-Toilet-Replacement-Program.aspx

[15] http://www.calgary.ca/UEP/Water/Pages/Water-conservation/Indoor-water-conservation/Toilet-rebates/Residential-toilet-replacement-program/Residential-Toilet-Replacement-Program.aspx

[16] http://water.auma.ca/digitalAssets/3/3111_AUMA_Renewed_CEP_Plan_-_Targets_and_Actions__Draft_May_2014_.pdf

Strategies for Engaging the Public

How do we engage our schools, our communities and our province in the initiatives that this white paper will suggest to government?

The youth of Alberta believe that the government needs to play an active role in engaging, educating and encouraging its citizens to take more active roles in the conversation around water conservation. The youth of Alberta ask for the opportunity to help in these ways:

1. Engage citizens through events/curriculum to promote water conservation and awareness.
2. Educate citizens in open and transparent communication around water consumption and sustainability.
3. Co-create various incentives to help promote a more sustainable water future.

The government should engage Albertans by designing events and programs to increase water awareness in the province. This can be accomplished by creating new and encouraging existing school programs that effectively motivate the youth of today to become the engaged citizens of tomorrow.

Additionally, tools such as online communities, youth/community panels, and student groups can be utilized to encourage awareness among citizens at large. This will not only create a more water-aware Alberta, it will also help Albertans accept and support regulations and policies put forth by the government. By educating the citizens of Alberta, society will grow to understand and be aware of water challenges.

The government should provide transparent advertising regarding the consequences resulting from water consumption and use on the environment. The youth believe that it is imperative that the government show complete honesty concerning industry water usage and consumption. The youth of Alberta strongly believe that there should be complete transparency and accountability of corporate advertisements and government reporting. Transparency allows the populace to become more aware of water consumption and more accepting of new environmental policies.

Alberta's youth are a valuable resource needing to be utilized to their full potential to create a more sustainable water consumption strategy for the generations to come. Devising scholarships for students who show a desire to pursue environmental research is an important incentive. The government should also play a role in educating all levels of society, including industry leaders and business elite, regarding the fact that industry can be competitive while being more sustainable with regards to water consumption thus taking away the fear that companies will lose their competitive edge.

The youth of Alberta recognize the fundamental role that water plays in the future of their province and want very much to be involved in the development of future and ongoing strategies for a more sustainable water future for Albertans.

Alberta Conservation White Paper Writing Committee

Student Writers

Danielle Burrill, Akeel Khan, Malik Hatamleh, Jamie Dublanko (Queen Elizabeth High School)
Elise Jamieson, Tatyana Anderson (Spruce Grove Composite High school)
Devlyn Beeman, Paige Leek (Caroline School)
Ariel Zora, Karleigh Cyr (Medicine Hat High School)
Pariza Fazal, Megan Roda (St Mary's High School)

Provincial Panelists

Dr. David Hill, Director, Centres and Institutes and Research Advocacy, University of Lethbridge
Dr. Lars K. Hallstrom, Director, Alberta Centre for Sustainable Rural Communities, University of Alberta
Michael Seneka, Senior Hydrologist, Environment and Sustainable Resource Development, Government of Alberta
Sarah Pearce, Policy Advisor, Environment and Sustainable Resource Development, Government of Alberta

Mentors

Kim McLoed, Project Manager, Alberta Environment and Sustainable Resource Development, Government of Alberta
Terry Godwaldt, Director of Program, The Centre for Global Education
Milena McWatt, Team Lead, Inside Education

Lead Provincial Schools

Schools	Lead Teachers	Principals	School Board
Queen Elizabeth	Terry Godwaldt	Sue Bell	Edmonton Public
Spruce Grove Composite	Bob Winchester	Darlene Marcinkevics	Parkland
St Mary's	Dawna Richardson	Frank Durante	Calgary Catholic
Caroline	Sara Barr	Dean Pilipchuk	Wild Rose
Medicine Hat	Rhonda Hunder	Boris Grisonich	Medicine Hat