

AltaLink's Climate Change Submission Update

Stakeholders Raise Two Primary Concerns Regarding AltaLink's Climate Change Submission

AltaLink understands some stakeholders have raised two primary concerns regarding AltaLink's climate change submission/proposal to help create a lower carbon electricity future in Alberta. We understand those concerns are:

1. The current electricity market may no longer be viable once long-term contracts are provided to renewable generators.
2. An additional cost increase may be borne by customers due to more aggressive coal plant removal and higher levels of renewable generation in the market.

The following information provides data that both of these concerns are unfounded. The market has successfully responded to similar concerns in the past and will continue to do so as the market evolves in the future.

1. When the original PPAs were auctioned in 1999, the Balancing Pool held control of 25% of the energy market through unsold long-term PPAs. Through this considerable period of time, the hybrid market functioned quite successfully. AltaLink's proposal would result in the Balancing Pool initially having control of 22% of the energy market. The Balancing Pool would retain the option to hold the renewable PPAs or auction them to the market, whichever is most beneficial to Alberta consumers.
2. AltaLink's proposed lower carbon generation future enables more renewable generation, delivers a 50% improvement in emissions and will cost consumers no more than a predominantly natural gas generation future.

1. There will be substantial new generation supply available for incumbent and new investors to encourage market competition

Some have suggested that large amounts of new renewable generation under long-term contracts will be a barrier to effective competition in the market. The opposite is true. The retirement of coal capacity will create an unprecedented demand for new energy supply. In our proposal, approximately 4200 MW of coal generation will be turned over to the Balancing Pool at the end of 2020. Since the Balancing Pool will operate this coal generation primarily to provide a reliability safety net for customers, there will be a need for 31,000 GWh of new energy supply.

Over the 10 years from 2020 to 2030, the Balancing Pool will contract for renewable energy that will supply roughly half (53%) of the new energy supply gap created by coal retirements, leaving an annual, remaining amount of 14,600 GWh available to be supplied by the current market in the form of gas,

cogeneration, or other fuel sources. To put this in context, during Alberta's most recent high economic growth period, electricity load grew at 3% annually, which created new supply needs of only 2,400 GWh per year. There will be no reduction in the market size for existing generation investors even after contracting a portion of the supply from renewables. Instead there will be an increase in the opportunity for existing and new investors to fill the supply gap.

Lastly, we must remember that the Balancing Pool controlled approximate 2,400 MW or 13,600 GWh of unsold PPAs under long-term contracts, when the market auctioned off the PPAs in 1999. This was equivalent to 25% of the total energy market at that time and did not impede competitive new generation that continued to enter the market during this time. The contracting of renewable generation, even at our proposed 30% target level equates to 22% of the total energy market by 2030, which is still below the level that was controlled by the Balancing Pool initially in 2000. Alberta's market functioned successfully then and there is no basis to conclude that it will not continue to function successfully in the future at what is a lower proportion of long-term contracted renewable generation, under the control of the Balancing Pool.

The market has proven it can enable the right generation mix needed for a lower carbon electricity future

While the current market will be required to provide a sizable portion of the supply gap, it has proven it can do so. Since the market was created, over 38,500 GWh of new generation has entered the energy market. There is no reason to conclude that the market will not again respond to replace the 14,600 GWh energy required after the new renewable generation is taken into account.

Going forward the transition to more renewable generation will naturally create more opportunities for flexible generation resources such as gas peaking plants, energy storage, and interties to firm up the intermittent renewable energy.

Historically, Alberta has relied on the market to deliver this flexible generation and over the last 10 years, more than 1,500 MW of flexible generation, primarily peaking capacity, has successfully entered the market. In fact, smaller size, flexible gas generation is less risky to build and finance than larger base load generation and will therefore enter the market more readily.

The market, over time, has experienced different pool pricing dynamics as the generation mix in Alberta has evolved. During this change, new generation has come to market as needed and the market has worked successfully. Market participants have been able to respond in the past and will adapt to the change in the future as well.

2. The Cost to Consumers of a Lower Carbon Electricity Future Will Be Materially the Same

Cost analysis shows that a future based on AltaLink's Proposal will be no higher in cost for consumers than a future based on a "Dash to Gas" or "Do Nothing" scenario

The analysis below confirms that over the next 15 years there will be no material difference in cost to consumers if Alberta adopts our more aggressive renewable energy plan.

This is the case when compared to a “Do Nothing” scenario which assumes nothing is changed to drive more renewable energy, essentially keeping the current market structure in place and allowing coal to retire as per current plans. This is also the case when compared to a “Dash to Gas” scenario which assumes coal is transitioned to a reliability role on an expedited basis per our proposal and is replaced primarily with gas generation.

"Do Nothing" versus "AltaLink Proposal"	2021	2025	2030	Total
Cost (\$ millions)				
Do Nothing	\$5,817	\$6,086	\$6,599	\$95,231
AltaLink Proposal	\$5,964	\$6,417	\$6,535	\$96,935
% Increase in Cost	3%	5%	-1%	2%
CO2 Emissions (tonnes x 1000)				
Do Nothing	47,067	47,781	39,640	731,996
AltaLink Proposal	37,892	32,959	27,385	592,978
Decrease in Emissions	9,175	14,822	12,255	139,018
% Decrease in Emissions	19%	31%	31%	19%

"Dash to Gas" versus "AltaLink Proposal"	2021	2025	2030	Total
Cost (\$ millions)				
Dash to Gas	\$6,071	\$6,374	\$6,545	\$96,770
AltaLink Proposal	\$5,964	\$6,417	\$6,535	\$96,935
% Increase in Cost	-2%	1%	0%	0%
CO2 Emissions (tonnes x 1000)				
Dash to Gas	38,432	39,020	39,351	659,912
AltaLink Proposal	37,892	32,959	27,385	592,978
Decrease in Emissions	540	6,061	11,965	66,934
% Decrease in Emissions	1%	16%	30%	10%

Note: AltaLink would be pleased to review any details used in this analysis.

AltaLink’s proposal will remove 139 million tonnes of CO2 emissions compared to a “Dash to Gas” scenario which will remove only 72 million tonnes CO2 emissions, a 67 million tonne improvement in CO2 emissions. On a percentage basis, AltaLink’s proposal will achieve a 50% improvement in CO2 emissions at a cost to consumers that is materially the same as a “Dash to Gas” scenario. When you include a \$30/tonne value on the CO2 emissions reduced, AltaLink’s proposal will save customers \$4 billion in equivalent CO2 emission reductions or \$2 billion more than a “Dash to Gas” scenario.

Renewable generation costs are competitive on a levelized cost basis to other generation sources

Renewable generation is cost-competitive and our proposal results in no material cost increase to consumers. The success in Iowa and Nevada for a similar transition to renewable energy confirms the expected outcome. ***As previously noted, Berkshire Hathaway Energy Canada is prepared to immediately invest in a pilot renewable project to prove these facts. Financial details of an “earn-out”***

pilot used in other Berkshire Hathaway Energy renewable projects in the United States are available. The advantages of this pilot would be its:

- 1. rapid deployment,***
- 2. ability to prove out the competitiveness of renewable energy using this type of arrangement and***
- 3. result in the Balancing Pool (a Government of Alberta agency) earning a majority ownership position in the project to use for the benefit of Albertans.***

Additionally, long-term renewable contracts competitively procured by ISOs in Saskatchewan, Ontario and Quebec have achieved very competitive supply costs in the range of \$60-\$65/MWh.

AltaLink's proposal relies upon the continued success of the energy market as the new renewable generation only receives a portion of their revenues from the Balancing Pool long-term contracts. The remaining revenues will come from selling their energy into the market.

The concern of whether the energy only market is sustainable has been a widely debated topic since the market was introduced almost twenty years ago. The market has delivered the required new energy supply historically and has done so reliably. Over this period, prices have risen and fallen, market monitoring and reviews conducted, and incremental market structure changes have been made.

Our proposal has additional benefits that need to be considered in the transition to a lower carbon future

Converting coal generation to a reliability role available to the Balancing Pool provides a safety net in the event the market does not respond quickly enough with new flexible generation capacity. The amount of coal generation retained for reliability purposes by the Balancing Pool can be flexible and determined based on system need to ensure reliability. The coal generation can also act as an emergency supply should no other generation be available in the market and customer load needs to be shed.

We must remember, a predominantly gas generation future does not achieve the long-term benefit of enabling zero emission renewable generation. Additionally, the market becomes exposed to the future price of gas driving materially higher electricity prices for consumers.

Conclusion

AltaLink's proposal will achieve material CO2 emissions reductions and emission reductions 50% better than a "Dash to Gas" future at a cost to consumers not materially different than both a "Dash to Gas" or "Do Nothing" future. Our proposal will not impact the effectiveness of the market as our proposal for a hybrid market is no different than how the market has operated very successfully in the past when the Balancing Pool played a similar role.

We remain confident our proposal is a very viable and beneficial solution for Albertans and are prepared to continue to engage in any discussions with you, or the industry, on our proposal or the analysis included in our submission today.

Appendix: Scenario Assumptions for Estimating Cost Impact and Emission Reductions

Three scenarios are developed to assess the potential cost impact and emission reductions of AltaLink's climate change proposal. Key assumptions for each scenario are summarized below.

Do Nothing Scenario

This scenario assumes no policy changes on coal retirement or renewable development. Key assumptions include:

- 1% load growth for the study period of 2015 – 2030
- Coal retirement schedule follows federally GHG regulation
- Wind generation reaches 2,200 MW by 2030
- 15% reserve margin
- Mix of new capacity
 - Cogeneration – 20%
 - CCGT – 50%
 - GT – 30%
- Levelized cost of new generation
 - Cogeneration - \$65/MWh
 - CCGT - \$70/MWh
 - GT - \$100/MWh
 - Wind - \$80/MWh
 - Solar - \$120/MWh

Dash to Gas Scenario

This scenario assumes new policies are introduced to facilitate phasing out coal production ahead of the Do Nothing scenario and no new policy on renewable development. Key assumptions include:

- 1% load growth for the study period of 2015 – 2030
- Coal retirement as per AltaLink proposal
- Wind generation reaches 2,200 MW by 2030
- 15% reserve margin
- Mix of new capacity
 - Cogeneration – 20%
 - CCGT – 50%
 - GT – 30%
- Levelized cost of new generation
 - Cogeneration - \$65/MWh
 - CCGT - \$70/MWh
 - GT - \$100/MWh
 - Wind - \$80/MWh
 - Solar - \$120/MWh

AltaLink Proposal

This scenario assumes new policies are introduced to facilitate phasing out coal production ahead of the Do Nothing scenario and new policy to stimulate renewable development. Key assumptions include:

- 1% load growth for the study period of 2015 – 2030
- Coal retirement as per AltaLink proposal
- Renewable generation target
 - 10% by 2020
 - 20% by 2025
 - 30% by 2030
- 15% reserve margin
- Mix of new capacity
 - Cogeneration – 20%
 - CCGT – 20%
 - GT and other flexible capacity – 60%
- Levelized cost of new generation
 - Cogeneration - \$65/MWh
 - CCGT - \$70/MWh
 - GT - \$100/MWh
 - Wind - \$60/MWh
 - Solar - \$90/MWh