GENERAL BACKGROUND ON THE ISSUE AT HAND

ABOUT THE BILL

Bill 50, the *Electric Statutes Amendment Act, 2009* proposes that the Government of Alberta take on the responsibility of approving the need for critical transmission infrastructure projects. It amends three existing pieces of legislation: the *Alberta Utilities Commission Act*, the *Electric Utilities Act* and the *Hydro and Electric Energy Act*.

The Bill identifies approximately $14-20 billion in transmission infrastructure upgrades. The majority of the cost is allocated to building five new lines. Bill 50 includes five projects the government sees as critical:

- Two 500-kilovolt (kV) high-voltage direct current (DC), high-capacity lines from the Edmonton area to the Calgary and southern regions.
- One 500 kV double circuit alternating current (AC) line from the Edmonton area to the Industrial Heartland area northeast of Edmonton.
- Two 500 kV lines to Fort McMurray, including one from the Wabamun Lake area and one from the Industrial Heartland area.
- The strengthening of the transmission system in the south Calgary area, including an additional substation and/or new transmission line.
- New transmission development in southern Alberta to integrate wind energy.

Sources are stating the following costs:

- According to ATCO Electric, the facilities application to build a high-voltage transmission line along a corridor on the east side of the province between Edmonton and Calgary will cost $1.65 billion.
- AESO states that the lines from Edmonton to Calgary will cost $3 billion.
- AESO states that the comprehensive infrastructure plan will transmission facility investment cost $14-billion. It includes $8 billion for the government´s critical projects, but goes much further to include a whole range of smaller regional projects.
- Enmax staes that Albertans could see transmission charges on their electricity bills dramatically increase due to a proposed $14 billion dollar provincial transmission system project. Based on publicly available data, ENMAX anticipates the cost could soar beyond $20 billion upon completion.

The Bill removes the regulator (Alberta Utilities Commission) and its public hearings process for assessing the need for transmission upgrades and gives the province authority to approve "critical" transmission infrastructure.

Bill 50 has gone through first reading. Second reading has started and will continue in the fall 2009 legislative session. The first reading of the Bill took place June 1 where it was formally introduced to the Legislative Assembly. The second reading was started on June 2 and was debated by the Members of the Legislative Assembly (MLAs). A vote will be called at the end of this reading. The Committee of the Whole is when the bill is looked at in detail; it is a clause by clause consideration of the bill where amendments may be proposed. The third reading is when MLAs vote on the bill for the last time. Voting is by simple majority. The Royal Assent is when the Lieutenant Governor approves the bill on behalf of the Queen. The bill only comes into force on proclamation.

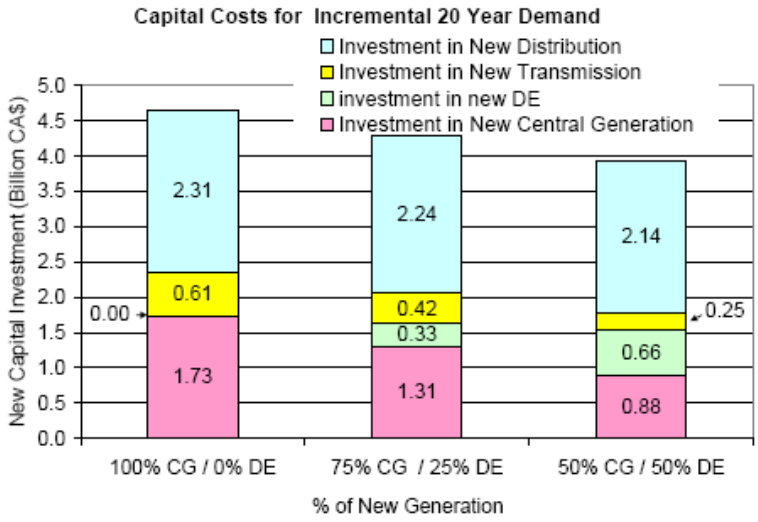
Information sessions on electricity transmission were held in July and August. The second hearing will continue when the fall 2009 Legislative sessions resume on October 26, 2009.

Supporters defend the proposed bill as expediting needed projects, while opponents argue it infringes on landowner rights and is an overly inflated capital outlay for transmission upgrades.

WADE CANADA'S 2006 ECONOMIC ANALYSIS (formerly known as NewERA)

The AESO's 2004 Transmission System Plan contained $1.5 billion of infrastructure upgrades. It proposed to build a transmission line between Edmonton and Calgary at a cost of $390 million. This cost was used to estimate the transmission capital cost and applied to a 20 year forecast as seen in Figure 8.1. On this basis, this was an investment that could have been reduced from $610M to $250M using a decentralized approach. Over time this would reduce capital costs by more than half (i.e., $360M). (Source: NewERA 2006, *Report on DE Economic Analysis - Two Canadian Case Studies 2006*).

Figure 8.1 – Capital Costs for Incremental Demand in Year 2025



Since this study was completed, the AESO has released a 2009 Transmission System Plan that contains more than $8.1 billion of infrastructure upgrades. Some of Alberta's most experienced energy professionals state that the implementation of this plan will cost Alberta up to $20 billion and will more than triple our residential monthly electricity bill. The estimated cost of the Edmonton to Calgary transmission line has more than quadrupled (i.e., $1.65 billion), and a second line has been added to the plan for a total estimated cost of more than $3 billion just for the Edmonton to Calgary transmission lines. In the same time period decentralized technologies such as industrial co-gen have achieved greater market acceptance and the cost of some technologies has dropped substantially. For example, the installed cost a photovoltaic technology in commercial systems has dropped from around $10/W to $5/W today. These factors substantially increase the potential for savings and make the need for more comprehensive analysis more critical than ever.

KEY FACTS

Most cities in Alberta have minimal electrical generation inside city limits other than standby generation. Our current centralized energy generation model generates electrical power far away from the point of use. The vast majority of our electrical power (almost 60%) comes from coal fueled power plants. Over half of this capacity comes from power plants that are 35 to 50 years old and have system efficiencies as low as 20-40%.

Delivering electricity across hundreds of kilometers via transmission lines results in an additional 5-8% loss of this resource.

By the time electricity reaches our homes, less than a quarter of the original 'lump of coal' has been used to meet electricity demands and three quarters of it has been wasted.

As our energy demands continue to grow, Alberta is exploring strategies to address the fundamental inefficiencies of our energy generation model. Delivering energy from centralized and inefficient power plants over several hundred kilometers is the heart of our problem. We can build high efficiency decentralized energy systems closer to the end user thus reducing capacity requirements of transmission lines and avoiding line losses for those specific generating facilities.

The benefits of decentralized energy include:

- improved efficiency through reduced line losses and thermal efficiency gains,
- deferred capital investments in transmission and transformation upgrades,
- increased reliability of the transmission and distribution grids,
- reduced emissions and health impacts from traditional energy systems, and
- reduced energy delivery costs through integration of energy generation into buildings design and community planning.

We can look at an energy future with decentralized energy in buildings and communities providing our primary source of energy and the transmission infrastructure as backup power.

"*Transmission infrastructure upgrades should be part of a balanced and long term transmission plan that factors in improved generation efficiencies, reduced peak demand and advancements in grid management. Advancements in 'smart grid' in other parts of the world are focusing a smart, self-healing grid infrastructure that can enable a highly interconnected and interactive network of power systems much like the transition from mainframe computers to personal computers and laptops*." Says WADE Canada President, Anouk Kendall

PUTTING IT IN PERSPECTIVE

Demands on transmission capacity can be partially offset by decentralized energy generation. The $3 billion proposed expenditure on the Edmonton to Calgary transmission lines could payfor over 530 MW of installed solar photovoltaic capacity or in excess of 2,000 MW of industrial cogeneration.

		Scenario 1	Scenario 2	Scenario 3	Scenario 4
		$900,000,000.00	$1,650,000,000.00	$3,000,000,000.00	$8,000,000,000.00
	installed price per MW	How many MW could we install?	How many MW could we install?	How many MW could we install?	How many MW could we install?
solar photovoltaic	$5,600,000.00	161	295	536	1,429
industrial cogeneration	$1,400,000.00	643	1,179	2,143	5,714

Residential Combined Heat Power (CHP) systems achieve system efficiencies of 80-90%, compared to the 20 to 40% for electricity from a central power station. Residential CHP can provide 1-6 kilowatts of capacity and are about the size of a dishwasher. Even if only 100,000 homes were to install residential CHP to meet their electrical and thermal demands, we could free up approximately 400 MW of capacity on our transmission line.

These are just a few examples of how decentralized energy can contribute to offsetting transmission capacity demands in Alberta.