

Intelligence MEMOS



From: Blake Shaffer and Joshua Rhodes

To: Canadian Electricity Consumers

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Re: **THREE FIXES FOR CANADIAN ENERGY POLICY TO AVOID TEXAS' ENERGY TROUBLES**

Texas is reeling from record cold temperatures that have pushed its electricity system to the brink, and beyond. Rotating blackouts have plunged millions into darkness and cold as its main grid operator fends off a catastrophic system-wide blackout.

While it is still early, and dissecting exactly what happened will take months if not years, some answers are starting to come to light.

First, this was an all-of-energy event. Demand for natural gas – for heating and power generation both – drive prices from their usual \$2 to \$4 per million BTUs into the hundreds of dollars. Production was shut-in as wells froze and instrumentation failed. Available natural gas supply was prioritized by emergency order for “essential human needs,” with heating taking priority over power generation and other industrial uses.

And every type of power generation failed, notwithstanding any finger-pointing from those all too eager to blame their least favourite fuel source. Wind, reliably unreliable in the words of *The New York Times*, produced at low levels compared to its maximum capacity, but only slightly under the grid operator’s winter projections. Coal and natural gas plants, relied upon for reliability, also struggled. A mix of unavailable fuel, ill-timed maintenance outages, and plant failures resulted in up to 40 percent of Texas’ thermal capacity being offline. Even nuclear struggled, as one of Texas’ four nuclear reactors tripped offline in the early morning hours of Monday.

In short, what could go wrong, did go wrong. It was a perfect storm of record breaking demand coupled with correlated failures across all types of supply.

The events of this week will provide lessons for power system planners and grid operators for years to come.

Looking to Canada, the spotlight shines particularly on Alberta, whose power grid shares many similarities with Texas: a similarly designed electricity market, dominated by fossil fuels but with rising shares of wind, all relatively isolated from neighbouring power grids. It is only natural to ask what lessons Alberta ought to learn from Texas’ power outages. But there are implications for the rest of Canada too.

Here are three:

First, build transmission. Without the ability to lean on neighbouring grids during stress events, the cost of maintaining reliability will be higher, as will the risks of failure. As grids continue to increase their share of wind and solar, the need for reliable resources will increase; transmission is an obvious solution.

Second, more responsive demand. For an energy-only market to function, responsive demand is essential. Facing \$10 per kilowatt hour, compared to typical power prices of roughly 10 cents on most monthly bills, many consumers will readily postpone a host of electrical applications. The trouble is few have the incentive to do so because few face the real-time price. Smart rate plans, enabled by widespread deployment of smart meters, are needed to both protect consumers from exorbitantly high prices and provide a price signal at the margin to encourage consumers to shift from periods of high to low prices. One example is critical peak pricing, which imposes higher charges during infrequent peak events. Another is enabling grid operators to control use on certain flexible devices in the home, such as electric vehicle chargers or air conditioning.

Third, focus on climate-resilient capacity for non-traditional peaks. The Texas grid failed because it is designed to withstand summer peaks; it is poorly set up for freezing cold. Alberta, conversely, is designed to manage extreme winter peaks. Case in point, the province just set a new demand record last week with nary a hint of system stress. The story will undoubtedly be different if and when peak demand in Alberta shifts to the summer. Alberta needs to [start preparing](#) its infrastructure today to be resilient to a changing climate, where extremes become the norm.

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