The Cold Facts !!!

Nuclear, dams, gas keeping Canada from freezing

During the recent blast of winter that buried much of the country, Ontario wind generation collapsed at the precise moment that some corners of the province were breaking cold weather records, writes Tristin Hopper in the National Post.

As much of Canada suffers through a winter of record-low temperatures, the country's lights and heaters are being kept on almost entirely without the solar and wind projects that have largely defined the energy policy of the last 10 years.

In Ontario, most dramatically, the province's wind generation collapsed at the precise moment that some corners of the province were breaking cold weather records.

On Saturday, the weather station at CFB Trenton recorded -29.3 degrees Celsius, the lowest-ever temperature charted at the site. The prior record had been set in 1948.

And this just happened to coincide with a 24-hour period in which Ontario's various wind turbines were all struggling to generate more than a tenth of their rated capacity.

At 6 p.m. on Saturday, Ontarians were consuming a peak load of 21,675 megawatts (MW) of electricity, of which just 138 MW (0.6 per cent) was provided by wind.

And although Ontario usually derives most of its electricity from either nuclear or hydroelectricity, in this case the slack was taken up mostly with fossil fuels.
Natural gas was responsible for 8,923 MW (41.2 per cent) at Saturday's peak hour, against 8,793 MW (40.5 per cent) for nuclear and 4,992 MW (23 per cent) for hydro.

In an extended social media post on Sunday, Ontario Energy Minister Stephen Lecce noted that if the province had been relying on "intermittent renewables" to get them through the cold snap, the system would have failed.

"Nuclear operated 24/7, hydro delivered steady baseload, and natural gas stepped in to meet peak demand — the reliability backbone of a northern, industrial economy," he wrote.

A similar phenomenon has played out multiple times through the winter. Cold snaps will yield massive demand on the electricity grid at the precise moment that politically popular energy sources like solar or wind are at their weakest.
On Dec. 23, a weather station in Braeburn, Yukon, plunged to -55.7 C, the lowest December temperature charted in Canada since 1975.

That same month, the territory's small wind generating capacity would drop to one of the lowest points of the year, and its array of grid-connected solar panels would generate nothing at all.
Throughout December, wind would generate just 0.36 gigawatt hours (GWH) of electricity — less than half of the 0.8 GWH it had been able to churn out in September.

All the while, the grid was kept alive largely thanks to fossil fuel backups.
During the summer, the Yukon's natural gas generators are generally switched off and the power grid left in the hands of the territory's three hydroelectric dams.

But thanks to a particularly cold December, natural gas ended up providing 37.6 per cent of the territory's total electricity; the highest share for the whole year.

For decades, most of Canada's electrical generation has relied on either hydroelectricity or nuclear. It's for this reason that Canadian electricity consistently ranks as some of the least carbon-intensive on earth. In recent years, however, policy-makers have encouraged a heavy push toward solar and wind. As recently as November, the Canada Energy Regulator was announcing that Canada was now building proportionally more wind turbines than hydroelectric dams.

"Wind power is set to dominate Canada's power growth over the next five years, accounting for about 70 per cent of planned renewable capacity additions," it wrote, citing 6,206 MW of planned wind projects against just 202 MW of planned hydroelectric projects.

Ironically, some of the loudest warnings against relying on wind power have come from the province that has adopted it more heavily than anyone else.

In just the last 20 years, Alberta has built out enough wind farms to the point where wind is consistently providing a higher share of Alberta's electricity than in any other province.

Nevertheless, Alberta Premier Danielle Smith has been at the forefront of challenging federal "clean energy" regulations that she's said would prematurely shut down the province's natural gas plants and put Alberta "at serious risk of regular brownouts and blackouts during the cold dead of winter, through the dog days of summer."