Feature

Update 2019/6/24
Arctic

CANADA'S FUTURE IS NORTH OF 60

By Gillian Ward

After a year of consultations, Canada's Special Senate Committee on the Arctic has issued their report, *Northern Lights: A Wake Up Call for the Future of Canada*. WaterToday heard from the Committee Chair, Senator Dennis Patterson, Co-Chair Patricia Bovey, and a confidential, Arctic born and raised source, to provide our readers with a First-person perspective.

The Canadian Arctic region has more shoreline, islands and channels than all other circumpolar nations combined. In an area roughly half of Canada's footprint, the Arctic looms large through this Senate report, deserving of our attention after decades of neglect, basic needs overlooked by successive cycles of government.

Abundant in untapped opportunity, the Arctic is long overdue for attention in the basic services and infrastructure that most Canadians take for granted. Access to safe, secure social housing options along the full shelter spectrum, education, emergency response services, roads and transport infrastructure, reliable heat, power and water, reliable supply of staple grocery items, reliable supply of fuel and communications channels are addressed in the report, along with all that is required to live the Canadian dream, an uninterrupted, high-speed internet connection.

Senator Dennis Patterson chaired the special Senate committee on the Arctic. The report is organized into the six themes of the budding Arctic Policy Framework: infrastructure, people and communities, sustainable and diversified economies, science and Indigenous knowledge, environmental protection and conserving biodiversity, and the Arctic in a global context.

The Senate Committee collected input from Indigenous and non-Indigenous residents across the Arctic region, recognizing that Arctic people will ultimately determine the priorities and solutions that will work in their communities, "For the North, by the North" being the mantra of the effort.

The first recommendation of the Report is that Canada should create a Ministry of the Arctic, funded and resourced to manage many interconnected issues that are currently trapped way down at the bottom of the silos of Canadian governance. Arctic climatic conditions being so unique, and changing so rapidly, is what defines the urgency of this work.

After the dedicated Ministry of the Arctic, housing came into view. Senator Patterson laid out the facts: a shortage of three thousand houses and budget allowance for forty-eight new builds per fiscal year equals a compounding overcrowding problem.

"Housing is such a fundamental issue, it impacts everything. Health, the tuberculosis resurgence in the Arctic, family violence, educational outcomes are all impacted by this one factor, the shortage of housing units", Patterson stated. "Overcrowding in homes leads to mental and physical health problems. The report calls on Canada to move swiftly in making available the full continuum of housing, from single family homes to safe transitional living options.

Senator Patricia Bovey spoke about the interconnectedness of the issues presented over and over again through the committee's year of travel and consultations with Arctic residents. "The Arctic is a place of world record suicide rates" says Bovey. Government spending allocated to relieving pain is a matter of priorities, allocation of resources, which the Senate Committee report suggests focusing on the Arctic now, for the benefit of Canada in the future.

WaterToday was privileged to spend an evening with a young woman born and raised in an Arctic remote community. The woman is presently living in the south, where there is abundant access to the social programs and resources that she needs.

Our confidential contact seemed insulted that Canada should suddenly regard the far north as "neglected", as though her relatives must be sitting on rocks gazing out to the sea waiting for salvation wrapped in the red and white flag of Canada. "It actually makes me kind of mad", she said. while explaining that what is still most relevant is common sense, hunting skills and relational systems.

Senator Bovey spoke of an education gap, where some Arctic students had completed Grade 12 with honours, only to find out that their skills had not prepared them for University in the south. Grade 12 honours equivalency in the Arctic meets up with Grade 5 Math and Grade 7 English, according to Senator Bovey. Support for all levels of education is sought, including Basic Adult Education and establishment of an Eastern Arctic University.

Our local source thought the roads, energy and communications infrastructure improvements would be nice to have, but was most adamant about a need for shelters, for mental health facilities and counsellors. Though she was too young to

have been caught up herself in the residential school era, she suffered the same matched set of abuses in her adoptive home. The cycle of abuse is not easily removed from generations, but can the same entity that brought the residential schools fix the breach now?

The Senate Committee indicates that their work has been guided by the Truth and Reconciliation Commission Action Items. Respect for Arctic Indigenous cultures, languages and traditional knowledge is evident in the report, as recommendations address the link between science and traditional knowledge, to be developed further.

The *Wake Up Call* recommends a dedicated fund for Arctic Infrastructure. Senators, being tasked with representation of regional interests regardless of population, have been called upon to ensure that the basic services are made available to Canadians everywhere, even in the most remote settled locations. Lacking the tax base to cover the cost of the proposed federal investments, Senator Patterson explained that the report is not asking Canada for an Arctic handout. Investment in Arctic infrastructure not only improves living conditions for residents, it generates opportunities for industry development and employment. "Every item required for industry in the Arctic is produced in the south", says Patterson, any investment in the Arctic should be considered a sensible investment to grow the Canadian economy.

The report calls for an Arctic Building Code, reflecting the regional climate conditions. Senator Bovey explained that the climate conditions in the north impact building materials differently, and this needs to be considered in a new building code for the north.

The report takes into consideration the high cost of mould on assets and human health. "We need to consider mould", stated Bovey directly. Conventional cellulose building materials are ideal food for fungus, which develops rapidly in damp conditions. It does not seem to make good sense to invest in homes that readily acquire mould, or in building materials that do not hold up in the Arctic climate conditions.

Gerard Quenneville, founder of Volum modular homes, agrees that local conditions should dictate the materials and design of homes. "Technology is great, and there are great advancements being made in so many industries, but in housing construction, most homes are built the same as they were a hundred years ago", says Quenneville, who designs, manufactures and ships modular homes to the far north.

The Volum homes are built in a series of separate sections that can be arranged to suit each family. The modules are manufactured inside a clean, secure environment. In a conventional, on-site build, mould can set in when unfinished materials are exposed to weather. The Volum manufacturing facility eliminates the wild card of weather from home construction and provides more consistent quality for the end product.

Quenneville explains the Volum ideology, "We take many things into consideration in the design of the home, including how the building will be oriented on the lot. We make sure the majority of windows are on the south side,

to take advantage of natural light, and passive solar energy gains. These homes are joyful to live in. We have designed them for fun, living should be fun."

Volum homes are packed flat for shipping with fixtures with all of the mechanical parts that power the home housed in the Energy Box. The noisy, mechanical aspects of homes are contained in a separate space, preserving the pleasant atmosphere of the living space. The Energy Box can be outfitted with solar and wind energy gear, rainwater collection, batteries and power boxes, among other options. When any of the mechanical gear needs to be serviced, this home design maintains privacy and security of the living space, as service technicians only need to access the Energy Box.

Finishes are clean, simple and modern, colours are bright and cheerful. Kitchens are open, with work space facing outward to windows and conversation, rather than isolating the cook, or forcing the family food prepper to face the wall. Separate modules can be ordered to add space for additional family members, all on one level, maximizing accessibility. The homes do not have basements and can be set upon special foundations that prevent them from shifting or cracking as the ground shifts.

Professional Engineer Bill Vangool responded to a request from Canada Mortgage and Housing Corporation (CMHC) decades ago, to solve the problem of homes sinking in the Arctic permafrost. When conventional foundations fail in unstable geology, portions of the home drop, cracks form, doors will not open and close properly and many homes become uninhabitable. Vangool's company adapted a concept for dome construction to create a rigid base structure of tubular steel, set on a multi-point system, all tied together with steel plates. The half inch plates float on the surface of the ground, supporting up to three stories above in one stable plane.

The steel foundation rests on the terrain much like a raft on the water. When the ground shifts below, the home is solid on its frame, with no cracking or alteration of function. Even if only 20% of the foundation plates are touching the ground, the structural integrity of the building is maintained. Vangool claims that in thirty years of designing and manufacturing these systems, they have not had a foundation fail.

Mr. Vangool is semi-retired, having sold his company, Triodetic, (found at www.multipoint-foundations.com) but he remains connected as the company's Chief Engineer. He explains that the technology has not been readily adopted by mainstream engineers, as it negates the need for geotechnical survey, a major source of work and revenue for engineering firms. When it comes to melting permafrost, geotechnical surveys cannot predict how much change will occur over time. The multi-point foundation works anyway, maintaining the building through whatever change may come, right to the point of needing to be physically moved to a new location, in which case, the home remains secure.

When an Alaskan coastal village experienced the collapse of their shoreline, the homes were raised up and Triodetic steel tubular foundations were installed below, taking two to three days for each home. Two steel skis were installed under the multi-point foundations, allowing the structures to be pulled over land to a new village site without damage. These are the clever innovations that are

available to mitigate climate change in the Arctic, and all of this is to be considered in the new building code.

Senator Patterson spoke of the dire need to remedy a deficit in basic infrastructure elements, transportation, energy and communications. With the current state of infrastructure, no forward progress can be expected in the Arctic economy until basic improvements are made.

The transportation, energy and communications infrastructure are in need of expansion and upgrade, not only for the local population basic health and safety, but as a precursor for economic development.

Senator Patterson says that mining in the Arctic is up to three times more costly than elsewhere in Canada, due to lack of critical infrastructure. This lack is the single greatest impediment to development of northern resources and economy. "We are not asking for a hand out for the Arctic with no benefit coming back for the rest of Canada. Every supply item needed in the north for mining, or exploration, oil and gas is manufactured in the south. Any step taken to develop the northern infrastructure will be profitable for all of Canada", explains the Senator.

Gerard Quenneville estimates that up to 70% of our energy bills in Canada are spent just to keep us from freezing to death. This estimate could be low for the Arctic. Most homes and businesses heat with diesel fuel, which is transported in quite finite doses via cargo ship, once a year. Any unforeseen, unplanned event that disrupts the supply ship, or increases the demand for supplies triggers a crisis of flash-freezing proportions. Increasing volume of marine traffic in the northwest passage places a demand on very limited resources should anyone have a mishap. All of this underscores the need for better energy options and maximum use of passive solar and wind energy.

Accurate maps of the changing landscape are scarce if non-existent, presenting new dangers for marine navigators and adding to the need for Arctic based emergency response services and security patrols. With more open water, increasing numbers of commercial and private adventure vessels are showing up in the northwest passage, increasing the need for many resources.

Security is an issue with more open water in the northwest passage and melting ice in the channels. Risk of maritime incidents increases with the changing shorelines, wherein accurate maps do not exist due to the rapid and drastic changes, partially to blame for passenger vessels going aground and stranding civilians in places quite unprepared to handle them.

With the increase in commercial and pleasure craft in Arctic waters, the Coast Guard has been challenged to expand its fleet of emergency response vessels, including the much anticipated construction of the John G. Diefenbaker icebreaker, slated for mid 2020's but desperately needed now.

Senator Patterson reported that a cargo ship with the annual delivery of critical supplies for several remote communities was held up for an extended period of time, waiting for an ice breaker escort that was otherwise engaged in attending to a pleasure craft emergency. As for the true north, we hope the John G.

Diefenbaker makes it from the drawing board to the new commercial port in Iqaluit, sooner than later.

gillian@watertoday.ca

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