



ARCTIC INNOVATION

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The Circumpolar North faces major challenges in the years ahead, beyond the often-mentioned issues of climate change, indigenous empowerment and rapid resource development. While the world's attention has shifted north in a way not seen for generations, the reality is that the region is not yet well-placed to tackle the challenges and capitalize on the opportunities posed by the 21st century. These are remarkable times, marked by the fastest and widest scientific and technological transformation in world history and the shift in requirements for personal and collective capacity building in the regional population.

The circumpolar world has to keep its eyes firmly on the climate change and resource development issues, but must also integrate into its planning the challenges of the changing world of work and the prospects that technological discoveries could greatly enhance the quality of the life in the region.

Northern resource development is possible largely because of continued improvement in extractive technologies, transportation systems, weather monitoring and the like. Continued improvement in these areas will make regional development more efficient, less expensive, safer, environmentally sustainable and more dependable. Technological advances could – and should – also contribute to sharp improvements in the quality of life for residents in the area. The advent of the internet services, admittedly requiring improvement across the Far North, have already brought major changes to the Arctic, from e-commerce to digital education, from greater access to entertainment to the early stages of telemedicine.

Circumpolar innovation, however, is at its infancy. At present, the world's technophilanthropists, like Bill Gates, focus their attention on the global South, where investments in clean water systems, social media innovations, new health services and the like can and have brought sweeping changes to literally millions of the world's poorest people. No comparable effort is being made in the Far North. Given that rich nations control the Arctic, it has fallen

to these countries to take up the challenge of Arctic scientific and technological innovation and to develop innovative solutions to northern conditions. Outside of the resource sector, development has been slow. To date, there has been no concerted and truly innovative approach to improving the quality of life through innovation. Northern regions get later and smaller versions of southern innovations, with very few North-centred innovations delivered as yet.

The North's future hinges, in substantial measure, on a truly circumpolar initiative to capitalize on new technologies to address pressing Arctic issues. On issues from domestic water supplies, northern food security, aggressive digital medicine systems, advanced educational technologies, remotely controlled delivery technologies, improved construction materials, responsive e-government approaches, improved Arctic clothing and the like, there is far too little research and development underway. Companies are loathe to invest the necessary money on the comparatively tiny Arctic population. An innovation that gains traction in the global South could find several billion users in short order; a comparable solution suited to the needs of the Far North might attract several hundred thousand consumers.

Responding to the technological opportunities of the 21st century requires the rapid and effective mobilization of Arctic talent and resolve. No one northern nation by itself has the technological capabilities, research facilities, entrepreneurial acumen or risk capital necessary to attract sustained attention to Arctic challenges. Collectively, the circumpolar world has a sizeable market, talent pool, business environment and human resolve to make more, if not the most, out of the greatest sustained, intense and remarkable period of scientific and technological change ever experienced. If this effort is left to national innovation ecosystems and to existing free market solutions, it is all but assured that the Far

North will fall technologically behind the rest of the developed world, not on the resource and climate change front, but rather on the quality of life sectors of greatest importance to the people of the Arctic.

The 21st century will not be won by those countries and regions that move slowly and cautiously, but rather those that innovate at the speed of the technological revolution. The Arctic is not well poised for a technological acceleration at present. Most of the innovative work – the research facilities and the highly talented people behind the rapid improvements in extractive and other technologies – are located in the South. Diseconomies of scale have limited northern entrepreneurial innovation and regional capacity building across the Arctic. The Far North is, indeed, on the verge of being left far behind through a series of technological transitions that will make the shift from company/resource towns to fly-in fly-out operations seem minor in comparison. The future of work, the sustainability of communities, the quality of life for northerners, and the opportunities of technologically-based transformation all hang in the balance.

There is a way forward, but it requires great resolve and commitment on behalf of Arctic governments, business and citizens. The transitions of the scientific and technological revolution are upon us, just as the world of work and capacity building are already shifting rapidly. Meeting the challenges and opportunities of the 21st century requires a fundamental change in the North's approach to innovation and capacity building, with the two elements closely linked. Collaboration amongst northern peoples is essential; there are no outside agencies beyond national militaries and the extractive industries focusing their attention on circumpolar innovation. An Arctic innovation ecosystem, which draws together the best minds from science, business, government and the indigenous communities, is essential if the region has a hope of competing with global technological change.

