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Editorial: The past is the future?

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What if a new vehicle could pick up almost anything and transport it almost anywhere? What if this vehicle could fly goods over land or sea at the lowest energy costs and the least environmental impact? How would that change the world? About once every 30 to 40 years since the Industrial Revolution, new innovations in transportation technology have emerged that changed the world economy. Steam ships and railways exemplified transport in the 19th century; trucks, airplanes and intermodal containers characterized 20th century transport. In the 21st century, the most promising technological advance in transportation is the new generation of cargo airships.

The challenge for airship transport is no longer technical. Materials exist to build reliable, robust and economic airships. New aero-engineering designs and advanced weather forecasting models are able to minimize safety concerns. Vectorable engines and computer avionics can control airships without the need for ground crews. The principal hurdle is the lack of business confidence and policy direction to support investment in a technology that was written off 70 years ago as dangerous and unneeded. Concerns about climate change justify a second look.

The increasing pace of global trade requires fast, low-cost, reliable, point-to-point transport. The demand for airfreight is doubling every ten years. However, most freight does not need to travel at 800 kilometres per hour, and the public is starting to take note of aviation's damaging greenhouse gas (GHG) emissions. The aviation sector has the highest GHG emissions per tonne-kilometre, and great difficulty reducing energy consumption. Moreover, the altitude at which millions of tons of carbon are emitted by fixed-wing aircraft is more damaging than equivalent ground level GHGs.

Adaptation to climatic change is difficult and expensive, but the cost of disregarding the threat is unbounded. Coastal population centres could be devastated by rising ocean levels, the world food supply could be destabilized and remote communities could

become unsustainable. Already, climate change has made winter roads in Canada unreliable.

Airships are more fuel efficient than airplanes, and faster than surface transport. Helium gas provides the lift so the engines only have to push the vehicle through the air. Airships could carry loads greater than trucks, accommodate oversized equipment, and operate throughout the year at affordable costs. Airships accommodate alternative fuels more easily than other vehicles. Space allows either methane or hydrogen to be carried at low pressures. High altitude airships are being designed for solar power because of the large envelope area available for collectors. Eventually, solar collectors could be adapted to cargo airships, too.

The modern world is served by centuries of infrastructure investment in the current air, land and sea modes of transport. As the 21st Century begins three problems are becoming apparent. First, transport systems are becoming more congested as ever increasing volumes of trade and travel encroach on existing capacity that is difficult to expand. Second, the GHG emissions from transportation are being recognized as one of the most difficult environmental problems because of the inherent energy requirements of transport and the need for mobile fuel sources. Third, the gaps in the global transportation system are becoming more obvious as resource demands push exploration and development into more marginal and remote corners of the earth. Infrastructure investments can help alleviate the first problem, but the others need a new approach to transportation.

The world has a tremendous need for airships. Over 70 percent of Canada's land mass has no permanent roads. Continuing with the status quo is to leave the remote northern communities to fend for themselves. Northern resource opportunities in mining and energy are known, but unattainable because of infrastructure cost and environmental concerns. Canada is only one market for airships – Alaska, Siberia, the Congo, the Amazon and the Australian Outback all have remote areas that need better transport. The world also needs a cleaner alternative to GHG emissions of cargo airplanes. As the scale of new generation airships increase, they can also play a role in serving intercontinental air freight markets.

A dozen airship projects are active in eight different countries. Most companies are small innovators that are testing advanced concepts and control systems, but some large corporations are getting involved. Like many green technologies, commercial airships could have spin-off benefits that supplement or exceed the direct payback to their developers. The full benefits of airship innovations will be shared with users in urban centres as well as the remote and undeveloped areas of the world.

The development of airship technology has a parallel in fuel cells and wind turbines. All three technologies have been known for over 150 years, but only now have the demands for sustainability generated investment interest. It is time to move beyond the myths and airship pessimists and take a really hard look at this technology. Environmentalists have a role to champion developments that politicians and industry are too timid to tackle. Governments have a role to play as catalysts to accelerate the development of strategic technology. Just as public investment in fuel cells and wind turbine research is justified by the green dividends; it is time to direct resources to the development of cargo airship technology.