

A historical accounting of the fight against climate change

By: Alexander Bishay of the Virtual High School in Bayfield

This essay is the third place winner of the 2017 Lieutenant Governor's Climate Change Essay Challenge hosted in partnership with the Centre for International Governance Innovation.

July 1, 2067.

The fight to prevent climate change was successful, based on two international fronts; energy and agriculture. Each had their winners and losers.

The energy front was based off the transition between fossil fuels to renewable sources.

On the one hand, while the likes of solar, wave, and wind energy successfully made the transition from 'alternative energy' to conventional energy sources, this has limited our nation's industrial capabilities.

Essentially, moving away from fossil fuels was a painful transition, both economically and politically. In 2017, Canada had one of the most emissions intensive economies in the world, and had earlier dreamed of using its vast Athabasca oil sands to become an energy superpower. However, new federal regulations and taxes began saw the gradual phasing out of fossil fuel sources.¹

While this has generally paid off by now, the devaluation of one of our biggest economic assets temporarily stagnated the economy in regions that relied on them. For example, in 2015, the mining and gas sector made up 27% of Alberta's GDP, and the Atlantic Provinces were particularly dependent on coal for power.² Even when we put our lost economic opportunities aside, the transition was an expensive one.

Due to our climate, domestically produced solar energy was generally an unreliable producer, so we had to resort to other options. Wind, wave and tidal energy are the most prominent. The installation of windmills and tidal stations were expensive long-term investments, and were dependent, day to day, on the output of wind or tide.³

That said the switch to renewable resources did have an awesome effect on our CO2 output; with cars, homes and factories no longer burning fossil fuels but electrical based fuel cells, automobile contribution to climate change sharply fell to a small fraction of its 2017 output.

¹ <https://www.cigionline.org/publications/economic-opportunities-changing-climate>(Centre for International Governance Innovation) (Economic Opportunities from a Changing Climate) (February 21, 2017)(February 27, 2017) (Jeff Rubin)

² <https://occinfo.alis.alberta.ca/occinfopreview/industries/mining-and-oil-and-gas-extraction.aspx>(Mining and Oil and Gas Extraction) (www.occinfo.alis.alberta.ca) (Industry Profile) (March 3, 2017)

³ <http://www.awea.org/wind-energy-101>(American Wind Energy Association) (The cost of wind energy in the US) (Accessed March 3, 2017)

We have also been able to take advantage of the development of electrical ‘supergrids’ across the country and the world. Supergrids, based on high voltage direct current rather than alternating current, allow nations to distribute energy from abundant green sources, to regions in most need.⁴

For example, Alberta and Ontario have traditionally relied on the oil sands and nuclear power respectively, for energy production. Using a super grid, however, they can instead import surplus hydroelectricity from British Columbia and Quebec. Long distance transmission lines with Direct Current power allow us to deliver power with much less electrical loss over longer distances, resulting in greater energy efficiency.⁵

Asia and Europe have their own DC supergrids. For example, North Africa can now export surplus solar energy to Northern Europe, while off-shore wind farms in Scandinavia can export surplus wind energy down south. China’s Gobi desert likewise exports solar energy to places as far east as Japan.⁶

The second front was based on agriculture.

In 2017, the meat-based diet was widespread across the parts of the world that could afford it. However, as the western diet was exported to more parts of the world, it became clear that this trend was unsustainable. The ecological footprint and demand was beginning to outstrip the earth’s resources.⁷

There were two solutions that arose. First of all, vegan diets became more mainstream, for practical purposes. Raising animals for food has a high ecological cost on all fronts, from food production to water usage to methane by-product.

One solution has emerged, in the form of In-vitro meat. It is essentially meat grown in a lab. You take stem cells from an animal and you cultivate them in specific conditions, and they grow into customized pieces of meat. In-Vitro meat, while controversial in its beginning stages, became mainstream by the 2030s. It had the support of both animal welfare groups and environmentalists. As a rising population contributed to rising food costs, in-vitro meat was seen as a sustainable alternative to factory farming.

⁴ <https://www.technologyreview.com/s/513736/supergrids/> (MIT Technology Review) (Switch Enables Intercontinental Solar and Wind) (MIT Technology Review) (Published December 09, 2015) (Last accessed March 03, 2017) (Written by Kevin Bullis)

⁵ <http://www.youris.com/Energy/Energy-Grid/Supergrids-The-Challenging-Comeback-Of-Direct-Current.kl> (youris.com, European Research medical center) (Super grids- the challenging comeback of Direct Current) (October 20, 2016, March 3, 2017) (Emily Veronelli)

⁶ <http://www.nextbigfuture.com/2016/11/asia-supergrid-could-transmit-renewable.html> (Next Big Future) (Asia super grid could transmit renewable electrical power or low cost power from coal plants) (November 14, 2016) (March 3, 2017)

⁷ <http://www.bbc.com/news/magazine-33133712> (BBC News) (How many Earths do we need?) (BBC) (June 16, 2015) (March 03, 2017) (Charlotte McDonald)

Today, In-vitro meat is the largest source of animal protein in Canada. In the early days, it was labeled as more expensive. Today it's cheaper and the average consumer takes for granted that tonight's steak was grown in a lab.⁸ Livestock sourced meat is still available, but in a minority. Furthermore, the land that was previously used for livestock has largely been repurposed for foresting, further sequestering CO2 production.

In total, cultured meat has produced 96% fewer CO2 emissions than conventional farming before it.

Overall, the journey to where we are now has been a long one. By introducing Super-grids, we made alternative energy a more viable option across the world. By bringing the world to accept in vitro meat we helped cut a great deal of CO2 emissions from the atmosphere, allowing the Western diet to become sustainable. By pushing for long-term investments into green energy, at no small amount of short-term economic pain, we were able to meet the global challenge head on. Because of that, Canada, through innovation and leadership by example, has helped stop climate change.

⁸ (Laboratory Equipment) (In Vitro Meat and the Future of Food) (December 28, 2016) (February 27, 2017) (Lauren Scrudato, Associate Editor)