Ecological Footprint: Personal and Professional

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Moving into a new era of ecologically sound decision making has become an initiative most every country looks to benefit from. Successfully implementing policies and regulations that contribute to emboldening the sovereignty of our planet's health, is critical. So critical, that integration must begin at the individual level, first. Simply, having awareness of one's own ecological impact is of great importance. This includes honest reflection and constructive analysis in order to develop a plan of action that carries longevity and tends to the needs of the masses and our planet concurrently.

As of 2018, the Global Footprint Network (Global Footprint Network, 2023) determined that the average Canadian has a Biocapacity of 14.7 Global Hectares (GHA) and an Ecological Footprint of 8.1 (GHA) per person, which equates to a total Biocapacity reserve of 6.6 (GHA) (Global Footprint Network, 2023). This is astonishing in comparison to other global powers such as America with a reserve of -4.7 (GHA), or even China who holds a reserve of -2.9 per person (Global Footprint Network, 2023).

When evaluating my own personal impact on the environment, I was neither surprised nor shocked by my results. Although, being able to place a number to my impact was welcomed as remaining ecologically conscious is of the utmost importance to me.

Using the Global Footprint Network's 'Footprint Calculator', I was able to visualize my contributions and where in my life, adjustments can be made.

With a personal ecological footprint of 2.9 (GHA), a carbon footprint of 4.1 (GHA) and a total ecological footprint of 48% (Global Footprint Network, 2023), I can most definitely see where I've done exceedingly well, but more importantly, where I can improve.

As we have learned, there are plenty of global positionings, world perspectives and thought patterns that contribute to the impact we make on our earth. Whether wea re debating the formality of the Anthropocene era or discussing the contrasting opinions of Holistic versus Western worldviews, one thing is for certain – what we do, will absolutely make a difference. This is not exclusive to just one's own personal life but extends itself into the professions we pursue and the industries that they belong to.

I am a Computer Programming and Analysis student with a purpose, and that is to contribute to society in a positive and productive way. Yet, as much as I may want to alchemize a better world for everyone, I must consider the industry that I intend to do my work from – the Information and Communication Technology sector.

The Information and Communication Technology (ICT) sector, presents a dichotomy among developed countries, developing countries and their contributions with reference to imports, exports, and productivity. In 2021 alone, the Canadian ICT sector showed an immense boom in productivity despite the pandemic and its effects on the global economy (Innovation, Science and Economic Development, 2022). Surprisingly, our ICT sector outperformed the Canadian economy in terms of output, employment, innovation, and growth. During the pandemic, our ICT sector incurred 242 billion dollars in revenue, 104.5 billion dollars in GDP, 9.7 billion dollars in exported goods and 21.9 billion dollars in service goods (Innovation, Science and Economic Development, 2022) Not only this, but our ICT sector has seen increases of employment as well; with every 1 direct job in the sector, 1.3 additional jobs is supported (Innovation, Science and Economic Development, 2022). Toronto alone saw an increase in of 88,900 jobs between the years of 2016 and 2020 specific to the tec industry, becoming the 3rd best tech market in North America (Singer, 2022). While all of this is a positive sign for Canada and our ever-growing ability to persevere, one must ask the question: "what is the cost to our environment".

Greenhouse gases (GHG) are the focus and while the ICT sector contributes to approximately 2% of global emissions, it is also considered to contribute to *reducing* global emissions at an exponential rate (Shabaan-Nejad. S & Shirazi. F., para 2.1, 2022).

Graphically, this presents as a non-linear impact and instead an inverted-U; while the sector grows it creates sustainability and a reduction in GHG by developing smarter cities, transportation systems, electrical grids, industrial processes, and energy saving gains (Higon et al., 2017). However, this does not dismiss that smarter tactics need to be considered when *developing* sustainable products, and 'smart-centric' methods need to be considered more profoundly by policy makers (Shabaan-Nejad. S & Shirazi. F., p. 3, 2022).

The negative impact of GHG made by the ICT sector globally is grounded in the production of computers, electronics, and optical products, and this must be evaluated empirically with a consistent and critical lens that cannot sway.

The emissions involved with supplying technological products to the masses is not just determined through supply or demand, but through the development of a country's socio-political standing. For example, countries like China, India and Mexico have seen an upward trend of emission exports (Xiucheng et al., 2022). This inherently suggests that the more peaceful a country's population is or feels, the more development the population sees within its ICT sector and economic growth (Shabaan-Nejad. S & Shirazi. F., para 2.1, 2022). However, the development of digital industries intensifies the greenhouse effect, and the source of these developments need to be mitigated at the point of international trade.

Our fancy computers need to run and, they require batteries such as the Lithium-Ion batteries found in most Electric Vehicles and most certainly our phones.

The Lithium-Ion battery was made possible through the discovery of Lithium Cobalt Oxide and are only considered batteries once they are placed into one cell or multiple cells. Lithium ions move between a cathode (+) and anode (-) internally, and this all happens within as the electrons **move in the opposite direction of the device's external circuit**. While the battery is discharging, the anode will release the lithium ions to the cathode and create a beautiful flow of electrons that power said device (UL Research Institutes, 2021).

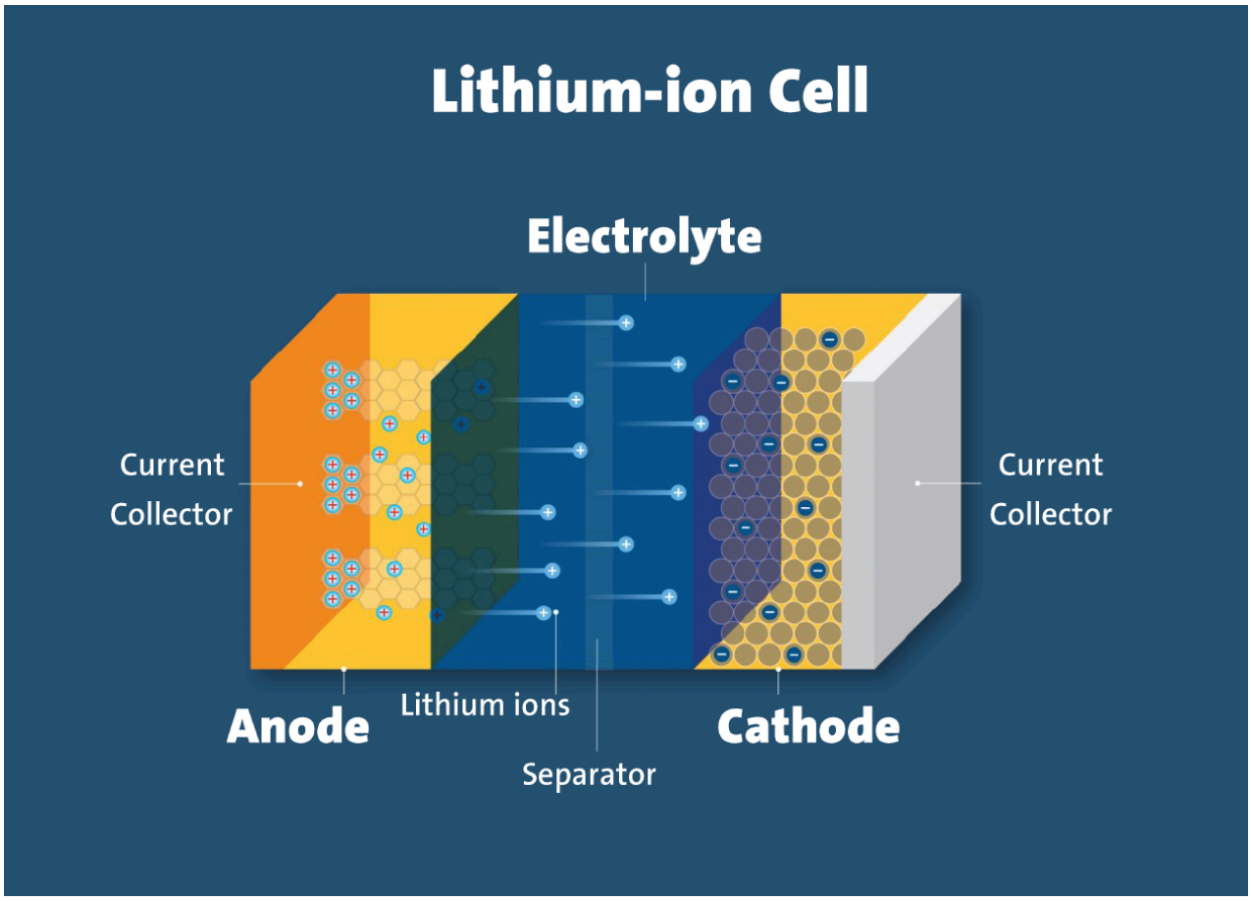

Figure 1. How Lithium Ions create energy for battery use. From UL Research Institutes, 2021, *https://ul.org/research/electrochemical-safety/getting-started-electrochemical-safety/what-are-lithium-ion*.

Extracting lithium begins in salt-brines where salt-rich water is pumped to the surface and into evaporation ponds. It takes only a few months for the water to evaporate entirely, leaving behind a concentration of lithium. For this to be effective, lithium processing takes a toll on our freshwater availability, creates water pollution and an immeasurable toll on human health and native biodiversity (Wanger, T.C. 2011).

It is the global behaviour towards these markets that is at the root of our predicament, specifically in the mentality of consumers. The demand is beginning to outweigh the supply and it is imperative that one ask's themselves – is having the newest tech necessary and how will this improve my ecological footprint on an individual basis? There are unspoken societal pressure within the West that create unnecessary product consumption, and this is directly related to the collective worldview the west holds.

Governments across the globe recognize that Lithium can be mined domestically. Canada may not produce Lithium, but we hold approximately 2.5 percent of the world's known lithium reserves (Government of Canada, n.d.). However, to reduce the impact lithium processing has on the environment, we must consider recycling our lithium batteries and even cutting it with other metals. Environmental change isn't an incentive if it's bribed with tax increases, tax breaks or credits – we can't be bought and shouldn't be seen as that simple. Yet, the behaviours we have exhibited empirically prompt policy makers to think otherwise.

The scientific and technological solution isn't as black and white as one would hope. In fact, the solution is firstly in political science and geoscience relationships. This means that placing funding into how we as Canadians research what would be required to find alternatives. We must form partnerships with the United States and European Union via joint green initiatives, trade agreements and exchanges of capital to find balance domestically.

This is no longer an option, instead it is necessary but the behaviour that contradicts our desires for environmental stability, such as over consumerism, capitalistic yearning and materialism will prevent us from doing so.

Until then, we will watch not only our economies evaporate but our supply to live a technologically 'connected' lifestyle.

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