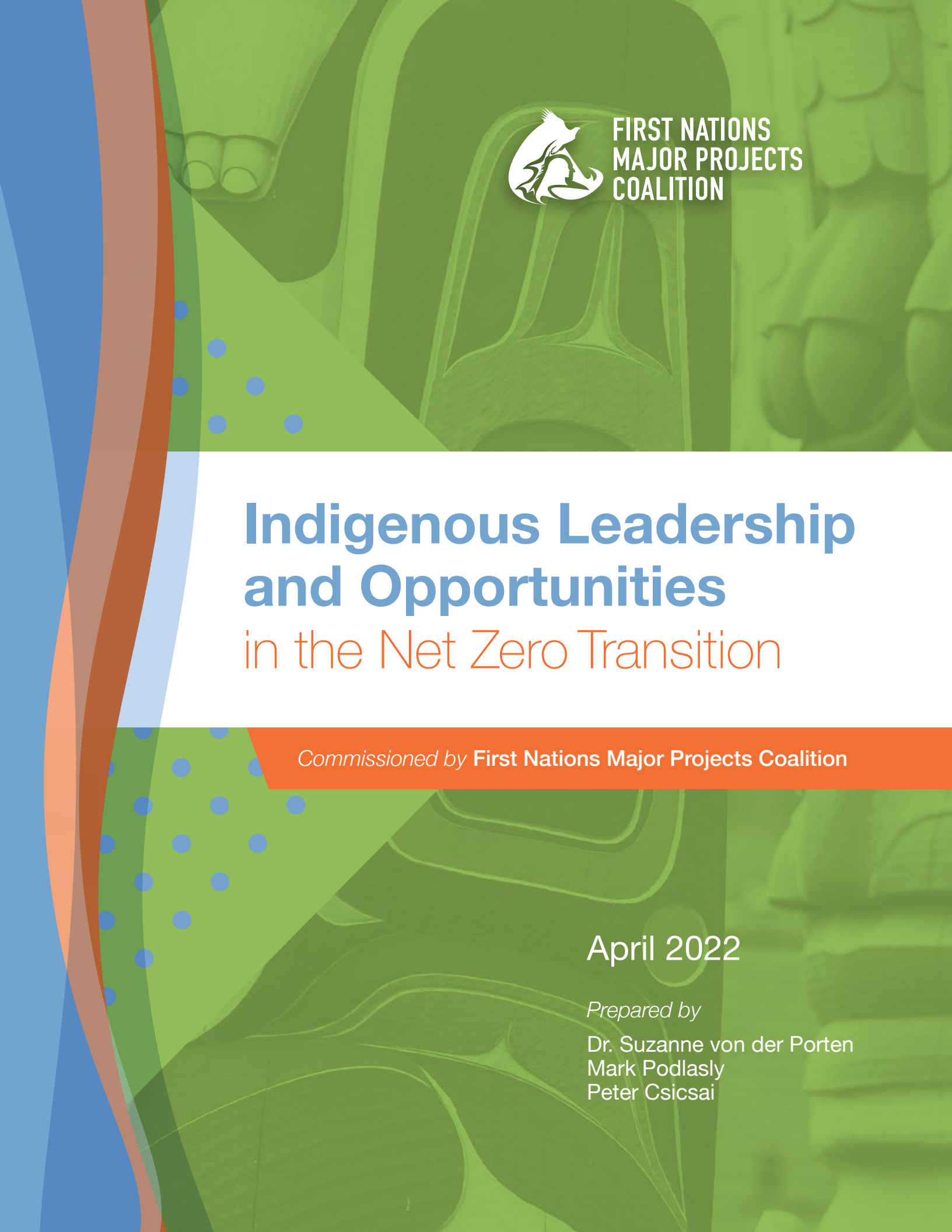

FIRST NATIONS MAJOR PROJECTS COALITION

Indigenous Leadership and Opportunities in the Net Zero Transition

Commissioned by **First Nations Major Projects Coalition**

April 2022

Prepared by

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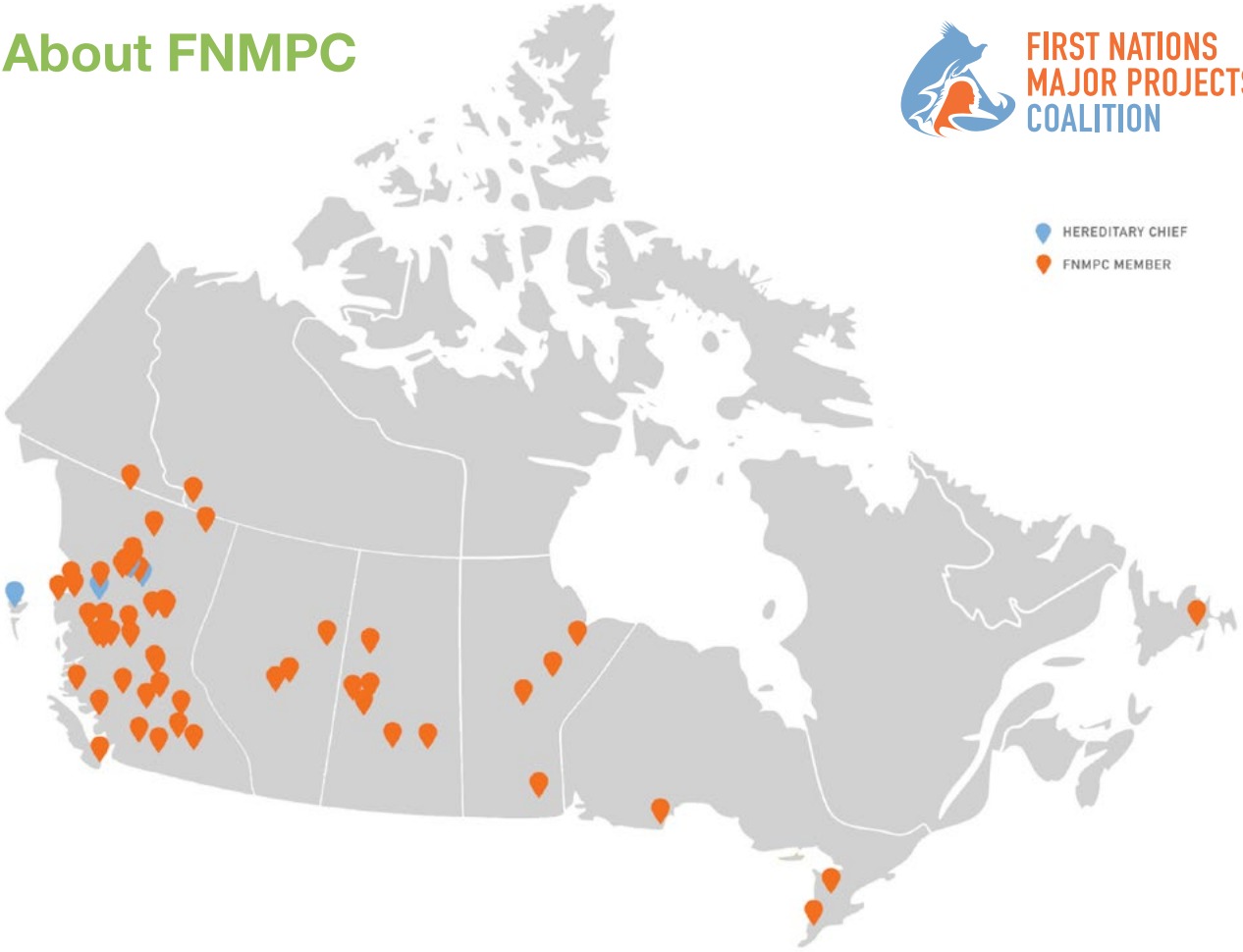
Stronger Together.

About FNMPC



The First Nations Major Project Coalition (Canada) is a national 85+ Indigenous nation collective working towards the enhancement of the economic well-being of its members, understanding that a strong economy is reliant upon a healthy environment supported by vibrant cultures, languages, and expressions of traditional laws, and in particular to support members to:

a) Safeguard air, land, water and medicine sources from the impacts of resource development by asserting its members' influence and traditional laws on environmental, regulatory and negotiation processes;

b) Receive a fair share of benefits from projects undertaken in the traditional territories of its members, and;

c) Explore ownership opportunities of projects proposed in the traditional territories of its members.

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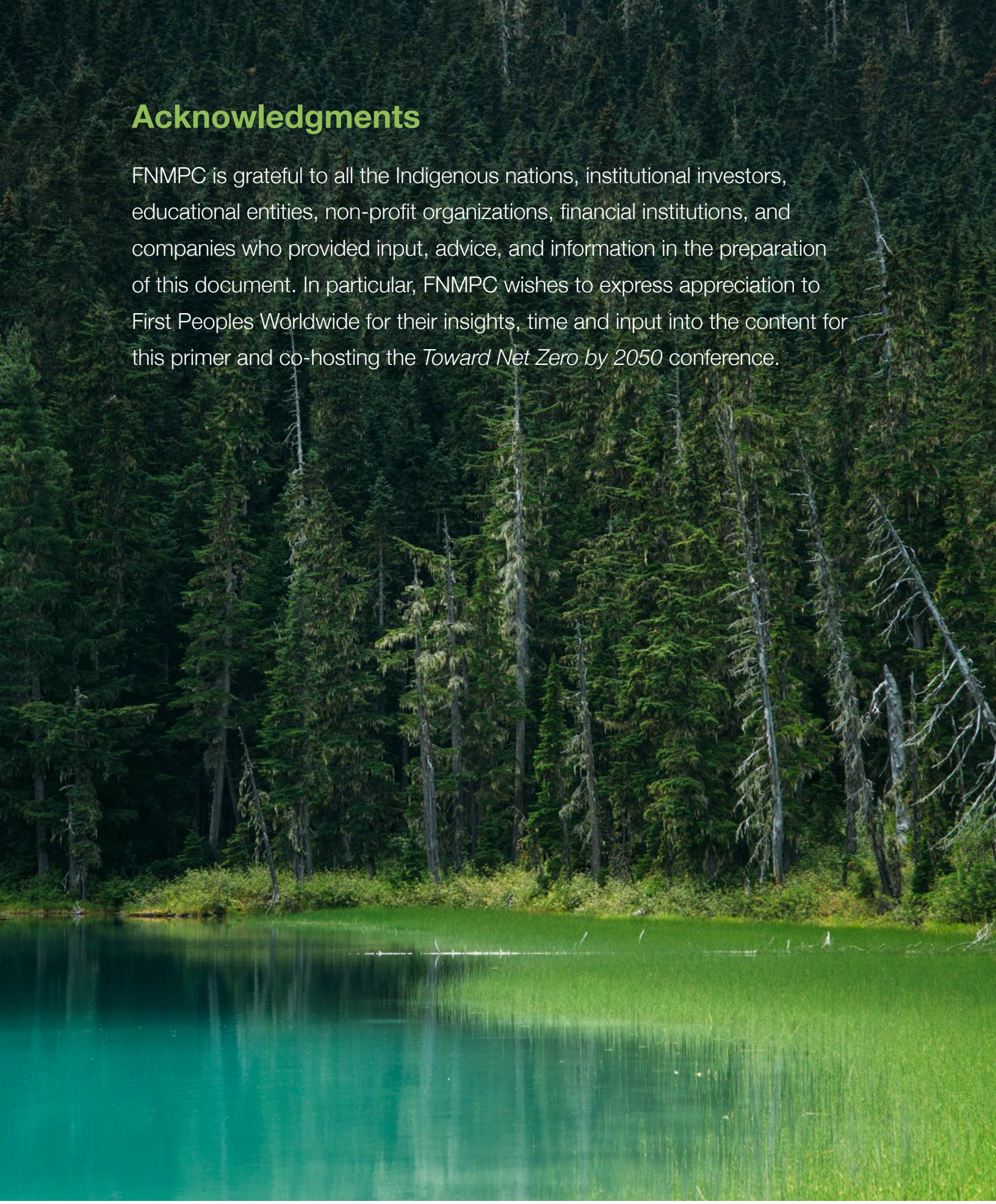

Acknowledgments

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Table of Contents

Executive Summary

Can we protect the earth's atmosphere fast enough to avoid catastrophic impacts and without further damaging and disenfranchising Indigenous lands, cultures, and societies? Can future net zero projects in the United States and Canada achieve environmental and social success, as well as prosperity without trading one problem for the other?

Canada and the United States must achieve net zero carbon neutrality by 2050 or risk contributing further to the catastrophic consequences of global climate change. Achieving our two countries' net zero targets by 2050 means that our economies ideally emit no greenhouse gases or become carbon neutral by offsetting all the greenhouse gas emissions that have not been eliminated.[1]

Most of the proposed solutions for achieving net zero by 2050 rely on using Indigenous lands and resources to build clean energy infrastructure and extraction projects worth up to $6 trillion.[2] These projects include new clean power stations, expanded transmission lines, carbon capture and storage facilities, and new mines to provide the raw materials needed for electric vehicle battery production.

Given the urgency of reaching Net Zero by 2050, what happens to our shared climate if Indigenous peoples are not included?

On April 25-26, 2022 Indigenous leaders, clean energy experts, mining sector executives, regulators, and investors will meet in Vancouver, Canada at the **Toward Net Zero by 2050** conference to discuss what will be required of energy, mining and financial proponents to ensure respect and protection of Indigenous peoples' rights and interests while we all work to save our planet in a 2050 net zero future.

This conference primer explores four important areas of transitioning to net zero that are, or may increasingly become, important to Indigenous nations in the United States and Canada. These areas are discussed in this four part conference primer:

[1] Offsetting emissions includes actions such as planting trees or using carbon capture technologies that can capture carbon before it is released into the atmosphere.
[2] Gignac, Julien. "Vuntut Gwitchin First Nation Officially Declares Climate Emergency." Yukon News, Yukon News, 22May 2019, https://www.yukon-news.com/news/vuntut-gwitchin-first-nation-officially-declares-climate-emergency/.

Part 1: Indigenous Peoples and Climate Change

This section introduces readers to the core concepts of net zero, such as what causes climate change, what emissions are, why net zero is important, the *Paris Agreement*, and importantly, how these are related directly to the role of Indigenous nations in the United States and Canada to achieving net zero commitments.

Part 2: Electric Vehicle and Storage System Batteries

This section is a discussion of the critical mineral battery supply chain, particularly how the supply chain makes, or breaks, electric vehicle (EV) production in Canada and the United States. Minerals essential to the creation of batteries, such as nickel and lithium as well as others[3], are already in sharp demand for clean technologies such as electric vehicles and energy storage. How will this mineral extraction occur equitably on Indigenous lands in the United States and Canada?

Part 3: Clean Energy Transition

This section highlights some components of the clean energy transition and how they are related to Indigenous lands in the United States and Canada. Topics include the generation of clean/zero emission energy (e.g., hydroelectric, solar, wind, geothermal, hydrogen, biomass, small nuclear reactors), transmission of clean energy (e.g., transmission lines), increasing efficiency to reduce the need for energy (e.g., building codes, retrofitting of existing buildings, and insulation of homes), and the role of hydrocarbons and sequestration (e.g., carbon credits, carbon offsets and carbon capture technologies).

Part 4: ESG Investment Standards and Net Zero

This section continues FNMPC's leadership on the discussion of putting the "I" (Indigenous) into ESG sustainable investment standards.[4] In particular, this section summarizes and further explores finance, policy, and regulation – particularly how these sectors support the energy transition to net zero in the context of Indigenous nations in the United States and Canada.

[3] Other critical minerals include: cobalt, graphite, copper, vanadium, manganese, aluminum.
[4] von der Porten, S. and Podlasly, M., "Roadmap to investing in Canada: Indigenous inclusion in ESG Indigenous Sustainable Investment Conference Summary Report." May 2021. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/05/FNMPC_Conference_Overview_v6.pdf.

Part 1:

Indigenous Peoples and Climate Change

"...we have a very real stake in the international community and our voices need to be heard, that this is not just an inconvenience to your bottom-line, to economies. This is a climate crisis."

- Chief Dana Tizya-Tramm, *Vuntut Gwitchin First Nation*[5]

[5] Gignac, J. 22 May 2019. Yukon News. "Vuntut Gwitchin First Nation officially declares climate emergency". www.yukon-news.com/news/vuntut-gwitchin-first-nation-officially-declares-climate-emergency/

For decades, climate change has been a reality faced by Indigenous peoples, many of whom reside far from major population centers. In recent years, the present danger of climate change has come to the rest of North America. Heat waves, droughts, floods, hurricanes, retreating glaciers, sea level rise, and catastrophic wildfires now impact every part of the continent, urban and rural.

To prevent further worsening of climate change, the scientists of the Intergovernmental Panel on Climate Change (IPCC) have called for action to limit global average temperature rise to 1.5 degrees Celsius and preventing the worst impacts of climate change, and to reach global net zero greenhouse gas emissions by mid-century.[6] Specifically, the IPCC, which is the United Nations body for assessing the science related to climate change, has recommended that limiting average global warming to 1.5°C above pre-industrial (1850-1900s) temperatures will limit the impact on the global climate. If the temperature rises more than 2.0°C, the effects will be even more pronounced. This 1.5°C average global temperature goal is what underlies the 2015 *Paris Agreement* which has been adopted by both the United States and Canada.

In order to implement their *Paris Agreement* commitments, Canada and the United States (like many other countries) have set the target of reaching net zero greenhouse gas emissions by the year 2050. But reaching net zero by 2050 will not be easy. It will require fundamental transformation in virtually all aspects of our economy. A coordinated effort is urgently needed to tackle this challenge, including within the main areas discussed in the **Toward Net Zero by 2050** conference, **each of which deeply** impacts Canadian and American Indigenous rights, peoples, lands and resources.

[6] IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty Masson-Delmotte, V.et al, World Meteorological Organization, Geneva, Switzerland, 32 pp.

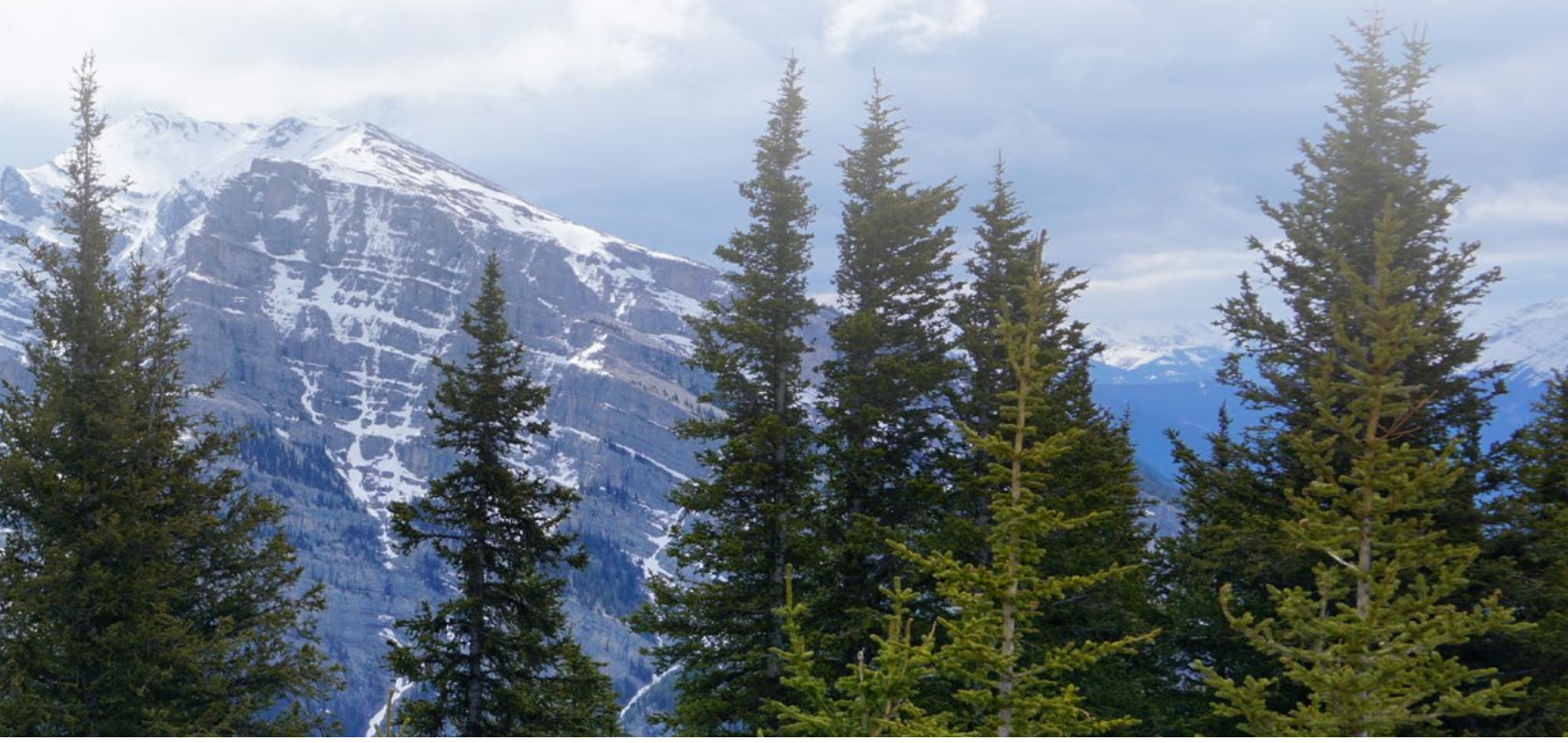
To reach Net Zero by 2050, the United States and Canada will require:

1. Up to 14 times more electric vehicle (EV) battery minerals like nickel, lithium, cobalt, and other rare earth minerals (US$1 trillion)[7];
2. Trillions of dollars for new clean energy projects and related infrastructure like clean power generation and transmission lines[8] [9];
3. New sustainable finance standards, practices and tools to fund the energy transition, mining, and related infrastructure, and;
4. New continent-wide coordinated energy policies and regulations.

These new net zero-focused energy sources and transmission lines will be on, or cross, Indigenous lands in the United States and Canada. The 14-fold increase in EV battery minerals will in large part come from Indigenous territories.

The transition to a sustainable, clean economy needs to be prioritized in Canada, the United States and globally both immediately and over the years and decades ahead.

Further, Canadian and American energy policy and regulations that are not compliant with the *UN Declaration on the Rights of Indigenous People* (UNDRIP) will be non-starters for Indigenous leaders, nations and their members – all of whom expect, at minimum, free prior and informed consent AND equity ownership on all new projects on their lands/waters.



[7] S&P Global. 22 September 2020. "Trillion dollar opportunity in battery metals demand, analyst says" www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/trillion-dollar-opportunity-in-battery-metals-demand-analyst-says-60440983.
[8] BBC News. 6 November 2021. "Infrastructure bill: $1tn for clean energy, internet, trains and more". https://www.bbc.com/news/world-us-canada-58152467.
[9] Royal Bank of Canada. 20 October 2021. "The $2 Trillion Transition: Canada's Road to Net Zero". https://thoughtleadership.rbc.com/the-2-trillion-transition/.

Indigenous Net Zero Conference

The First Nations Major Project Coalition (Canada) and First Peoples Worldwide (USA) will host the **Toward Net Zero by 2050** conference on April 25-26, 2022 in Vancouver, Canada where Indigenous leaders, clean energy experts, mining executives, regulators, and investors will meet to learn what will be required to achieve Canadian and American net zero targets.

The conference, as well as the many lead-up events and resource materials produced for it, are an Indigenous-led contribution to addressing the need for a roadmap toward net zero in the context of Indigenous lands, rights, and cultures in both the United States and Canada.

In this country, Canada's commitments to net zero emissions by 2050 signal that a different energy future is on the horizon in the immediate future, one that will require energy actors to engage differently, and collaborate toward shared outcomes for the very long term. For Indigenous actors, the long term represents cycles of existence that are thousands of years old.

– Dr. Dara Kelly *(Leq'á:mel; Assistant Professor, Simon Fraser University)*[10]

The intent of the **Toward Net Zero by 2050** conference is threefold:

1. To highlight how Indigenous knowledge, leadership, and creativity in current net zero initiatives point the way to future Indigenous-informed climate-saving initiatives that benefit many environmental, social and economic interests.
2. To inspire Indigenous nations and people, companies, and Canadian and American governments to ensure that the benefits of a climate-stabilized future are equitably distributed among all citizens who have contributed their lands, resources, technical and traditional knowledge, and capital to securing a sustainable world.
3. To convene Indigenous experts, topic experts, industry leaders and policymakers to share ideas and help to shape the roadmap to net zero that leads to real climate action and meaningful Indigenous equity participation in net zero projects.

[10] First Nations Major Project Coalition, Roadmap to Investing in Canada: Indigenous Inclusion in ESG, Indigenous Sustainable Investment Conference Summary Report, May 2021.

Please Watch

In the lead-up to the 2022 **Toward Net Zero by 2050** conference, the FNMPC held four mini-events online:

1. **Indigenous Rights and the $1Trillion EV Battery Market:**
   https://www.youtube.com/watch?v=UUer8A6UdJc

2. **The Emergence of Indigenous Geothermal Energy:**
   https://www.youtube.com/watch?v=6jI_zCkwjRI

3. **Economic Reconciliation: Getting to Net Zero:**
   https://www.facebook.com/canada2020/videos/1130386537712214

4. **Net Zero: Indigenous Women in Sustainable Finance & Business**
   https://www.youtube.com/watch?v=GtoXUpbgHdw

"No one ever does anything great alone."

– Chief Terry Paul, *Chief of the Membertou First Nation*

Toward
Net Zero by 2050
Conference

FNMPC'S 5th ANNUAL INDUSTRY ENGAGEMENT EVENT

"Indigenous leadership in the energy transition"

Key Net Zero Concepts

What is climate change?

Climate change, also referred to as global warming or global heating, are the long-term changes in global and local temperatures and resulting changing weather and ecological patterns. Previously, these changes (ice ages or prolonged warm periods) were part of earth's natural changes, driven by the solar cycle or volcanic events. However, particularly since the 1800s, humans have been the main driver of climate change, primarily because of our burning fossil fuels like coal, oil, and gas.[11]

What causes climate change?

These fossil fuels that we burn generate greenhouse gas emissions which effectively create a blanket insulating the earth, which then traps the sun's heat and raises average global temperatures.[12]

What are greenhouse gas emissions?

Greenhouse gas emissions are those gases in the atmosphere which insulate the earth creating the greenhouse effect. We emit greenhouse gases into the air anytime we burn fossil fuels, such as natural gas, oil, or coal[13]. The most problematic greenhouse gases include carbon dioxide, methane, nitrous oxide, water vapour, halocarbons, and ozone, all of which are contributing to climate change.[14] Carbon dioxide is released from activities such as the exhaust pipe of vehicles, from burning coal for heat, and the cutting down of forests. Methane is released, for example, from landfills for garbage and from the extraction of oil and gas from fracking and wells.[15]

Most Problematic Greenhouse Gases

CO_2= Carbon Dioxide
CH^4 = Methane
H_2O- = Water (Vapour)
O_3 = Ozone
N_2O = Nitrous Oxide
Halocarbons

[11] United Nations "What Is Climate Change?" www.un.org/en/climatechange/what-is-climate-change.
[12] Ibid.
[13] United States Environmental Protection Agency (EPA) "Sources of Greenhouse Gas Emissions" www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.
[14] Canadian Association of Petroleum Producers (CAPP) "Greenhouse Gas Emissions" www.capp.ca/explore/greenhouse-gas-emissions/.
[15] United Nations "What Is Climate Change?" www.un.org/en/climatechange/what-is-climate-change.

What are net zero emissions?

Net zero emissions (often referred to as simply net zero) refers to the overall balance between greenhouse gas emissions *produced* and the amount of greenhouse gas emissions *removed* from the earth's atmosphere. Net zero emissions is reached when the amount of greenhouse gasses added is no more than the amount removed/sequestered. To avoid the worsening of climate change, new emissions of greenhouse gases must be as low as possible. The largest contributor to greenhouse gasses are fossil fuels – coal, oil, and gas.[16]

Net zero can be the goal of a single country – like Canada or the United States – achieving the goal of massive reductions in greenhouse gas emissions to only those absolutely necessary, and in turn, those emissions are "offset" by the planting of trees or other forms of carbon sequestration (see Carbon Credits and Carbon Offsets section below). For example, if Canada is emitting 100 million tonnes of carbon dioxide, it would have to remove/sequester an equivalent 100 million tonnes from the atmosphere to become a net zero economy.[17]

Ideally *all* countries will get to net zero economies as soon as possible to achieve *global* net zero. However, reaching global net zero will not address the past emissions already in the atmosphere. Past emissions, which have been accumulating in earth's atmosphere, will still need to be addressed, but a net zero state will mean that we are no longer adding to the overall amount of climate warming gases in the atmosphere. While each country is unlikely to have total *zero* emissions by 2050, what remaining (and ideally minimal) emissions they do have must be offset (through removal/sequestration).[18]

Canada and the United States are among 120 countries worldwide who have committed to producing net zero emissions by 2050 to address climate change through the energy transition of their economies and industries.

Why is net zero important?

Even if all greenhouse gas emissions were stopped today, the centuries of previously emitted greenhouse gasses would still be present in the atmosphere. Greenhouse gasses stay in the atmosphere for years and continue to heat the planet long after they are emitted. Net zero will slow further warming of the earth's climate by not adding to these previously emitted greenhouse gasses. Achieving net zero will mean that we will not be making climate change worse. Net zero is effectively the point in time when we as humans stop worsening climate change.[19]

[16] Climate Council "What Does Net Zero Emissions Mean?" www.climatecouncil.org.au/resources/what-does-net-zero-emissions-mean/.
[17] Canadian Institute for Climate Choices "Securing Prosperity in a Net-Zero World" netzeroeconomy.ca/en/watch-videos/.
[18] Government of Canada, "Net-Zero Emissions by 2050" www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html.
[19] Climate Council "What Does Net Zero Emissions Mean?" www.climatecouncil.org.au/resources/what-does-net-zero-emissions-mean/.

What is the *Paris Agreement*?

To limit global warming to only 1.5°C by 2050, those countries who have adopted the *Paris Agreement* aim to reach global peaking of greenhouse gas emissions as soon as possible with the goal to achieve a "climate neutral world" or global net zero by mid-century.[20]

The *Paris Agreement*, created for countries to cooperatively avoid the worst effects of climate change, was signed by world leaders in 2015 at the UN Climate Change Conference (COP21) in Paris. The *Paris Agreement* sets long-term goals for all the signatory nations (includes 192 countries plus the European Union) which are:[21]

1. "To substantially reduce global greenhouse gas emissions to limit the global temperature increase in this century to 2 degrees Celsius while pursuing efforts to limit the increase even further to 1.5 degrees;
2. To review countries' commitments every five years;
3. To provide financing to developing countries to mitigate climate change, strengthen resilience and enhance abilities to adapt to climate impacts."

Climate impacts

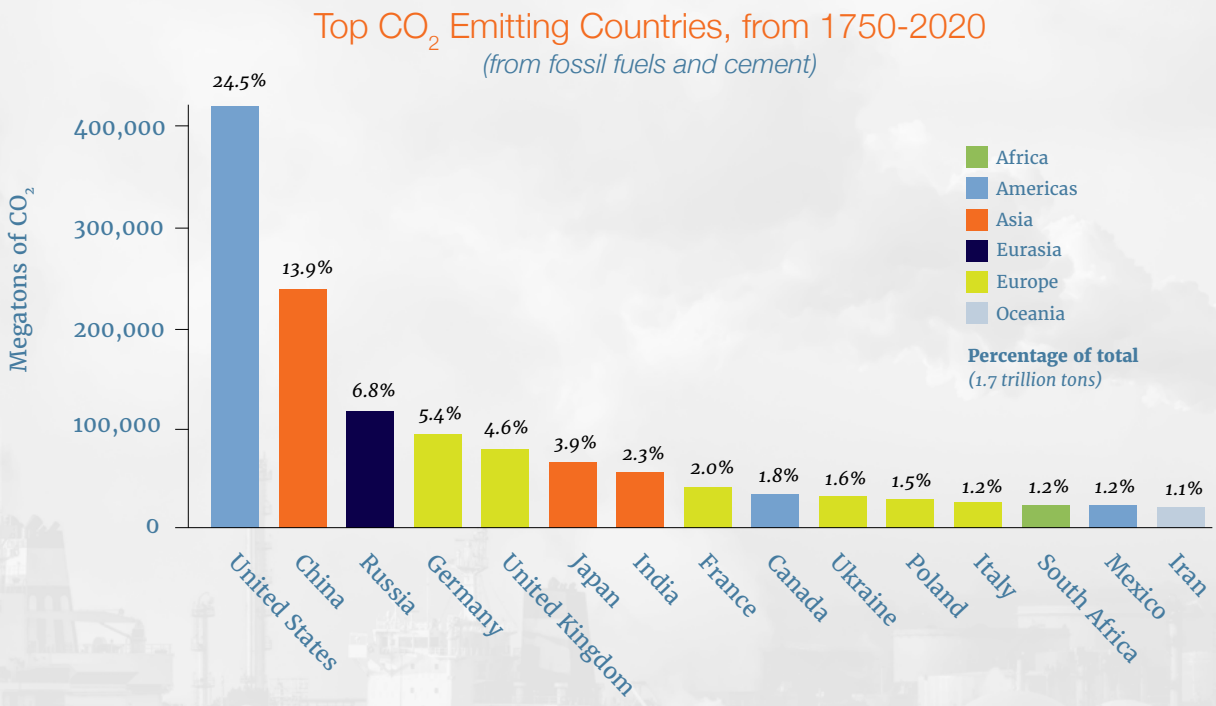
It is important to keep in mind that the ideal amount of global heating is zero (0°C) degrees. Even with 1.5°C of warming, there will be increasing climate change impacts, as we're already seeing around the world, intensifying by the year. These impacts include, for example, catastrophic wildfires, flooding, increased frequency and intensity of cyclones/hurricanes, melting permafrost, heatwaves, and sea level rise. These impacts, driven by the increase in human-emitted atmospheric greenhouse gases and resulting warmer global temperature averages, are not only deadly to humans, but are expected to, if unabated, cause a sixth extinction. [22] [23]



[20] United Nations Framework Convention on Climate Change "The Paris Agreement" unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.
[21] United Nations Climate Action "The Paris Agreement" https://www.un.org/en/climatechange/paris-agreement.
[22] "A mass extinction event is when species vanish much faster than they are replaced. This is usually defined as about 75% of the world's species being lost in a 'short' amount of geological time - less than 2.8 million years." There have been five previous mass extinctions on earth. We are currently going through a sixth mass extinction. Source: https://www.nhm.ac.uk/discover/what-is-mass-extinction-and-are-we-facing-a-sixth-one.html.
[23] Kolbert, E. (2015; 2014). "The Sixth Extinction: An Unnatural History" (First Picador; 1; ed.). Picador, Henry Holt and Company.

United States and Canada are big emitters of greenhouse gases

The United States and Canada have remained major emitters of total greenhouse gases relative to other countries around the world: together, Canada and the United States have contributed 17% (US 15%, Canada 2%) of the total global carbon dioxide emitted. Both countries are among the top 20 carbon emitters in the world.[24]

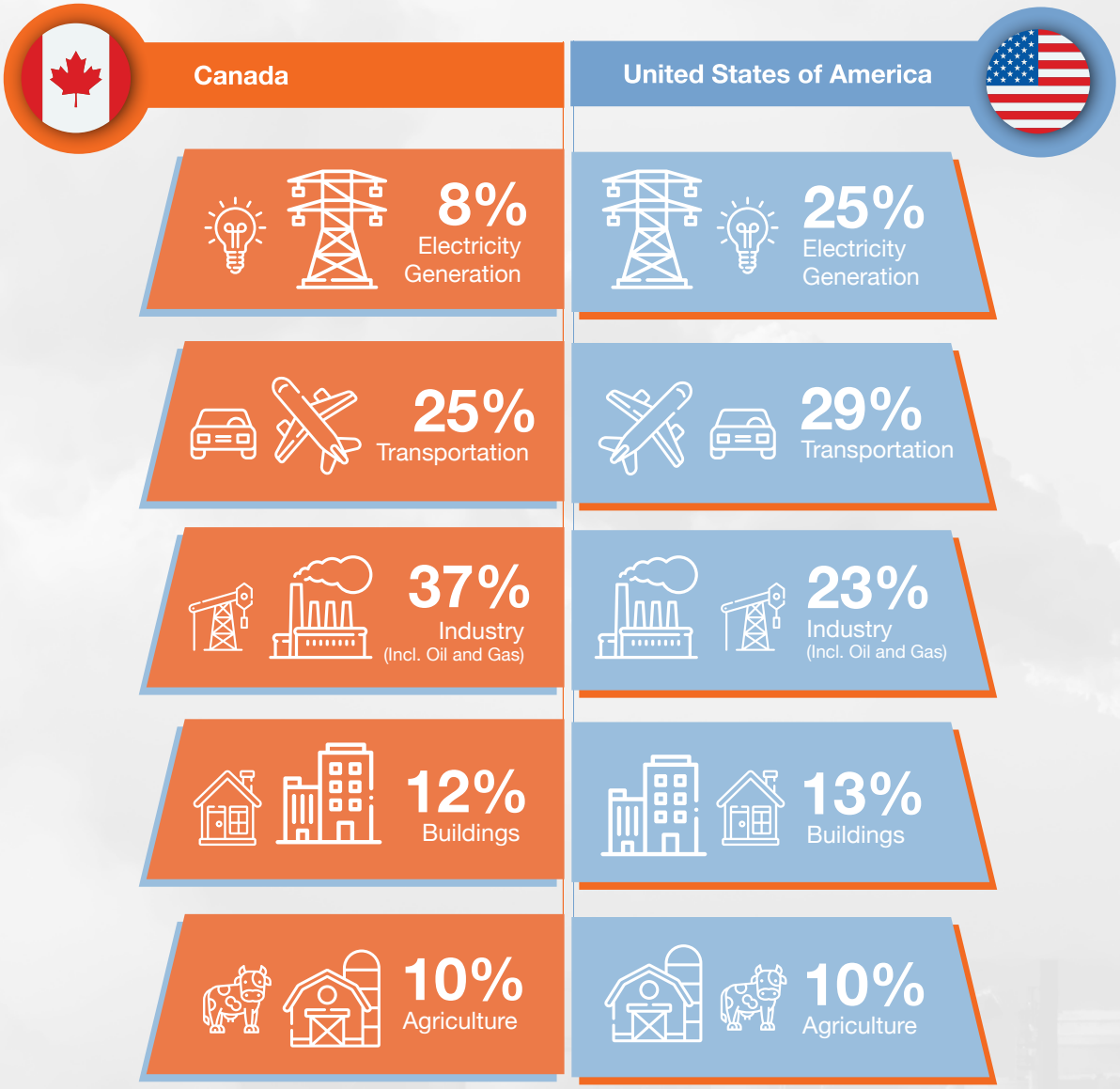


Source and infographic adapted from: Union of Concerned Scientists Global Carbon Project via Our World in Data https://www.ucsusa.org/resources/each-countrys-share-co2-emissions

The greenhouse gas emissions by the United States and Canada aren't simply because they are large or because of their populations. In fact, the numbers skew worse when per capita emissions are accounted for: in 2018, the United States ranked 4th and Canada 5th as the highest per capita carbon emitters in the world (after Saudi Arabia 1st, Kazakhstan 2nd, and Australia 3rd).[25] For both Canada and the United States, the major sources of greenhouse gas emissions include power generation, industry, transportation, buildings, and agriculture.[26]

[24] Union of Concerned Scientists. "Each Country's Share of CO2 Emissions" Updated Jan 14, 2022. https://www.ucsusa.org/resources/each-countrys-share-co2-emissions.
[25] Ibid.
[26] https://www.businesswire.com/news/home/20160823005380/en/On-Climate-Policy-Canada-and-the-United-States-Take-Different-Approaches-to-Similar-Greenhouse-Gas-Reduction-Goals-IHS-Markit-Report-Says.

Comparison of U.S. and Canadian 2019 GHG emissions and contributions of economic sectors to national emissions.



Source: US Environmental Protection Agency (EPA) 2019 and Government of Canada 2021
Infographic adapted from: Business Wire. https://www.businesswire.com/news/home/20160823005380/en/On-Climate-Policy-Canada-and-the-United-States-Take-Different-Approaches-to-Similar-Greenhouse-Gas-Reduction-Goals-IHS-Markit-Report-Says.

Opportunity

The room for improvement and reduction of greenhouse gases in the United States and Canada is huge. Conversely, the amount of greenhouse gases that Canada and the United States are emitting also means that there is an enormous opportunity for these countries to coordinate to reach net zero sooner and with greater economic benefits.

According to Clean Energy Canada, the GDP of the Canadian clean energy sector's total value expected to grow by 58% between 2020 and 2030.[27] This transition to a clean energy economy is well underway:

"In terms of value, the whole of Canadian energy is on track to grow by 20% over the next decade, driven largely by huge gains in the Canadian clean energy sector's GDP. The clean energy sector's GDP is forecast to grow an impressive 58% by 2030—significantly more than fossil fuels, which will grow only 9%. By 2030, clean energy will make up 29% of Canada's total energy GDP, up from 22% in 2020."[28]

This energy transition is well underway, but it is not happening fast enough to keep up with how fast we need to act to slow climate change. For one, the pace at which net zero infrastructure is coming online is falling short of meeting 2030 and 2050 global emission targets. Second, our current transition to a new global net zero economy has meant manufacturing and supply are lagging behind demand (for example electric vehicle supply is not keeping pace with market demand[29] and the mineral supply chain to supply battery technologies is expected to fall short of exponential demand[30]). Today's market shortfalls, as well as anticipated future supply shortages, are now coinciding with accelerating political will to achieve net zero. Together, these opportunities equate to huge potential for the American and Canadian sectors focused on the energy transition.



[27] Clean Energy Canada, June 2021, "The New Reality" https://cleanenergycanada.org/wp-content/uploads/2021/06/Report_CEC_CleanJobs2021.pdf.
[28] Ibid.
[29] Clean Energy Canada, October 2018, "Batteries Not Included" cleanenergycanada.org/report/batteries-not-included/.
[30] BBC News, 5 March 2021, "Tesla partners with nickel mine amid shortage fears" www.bbc.com/news/business-56288781.

Indigenous net zero

"Many Indigenous groups are striving to combat climate change by focusing on the economic opportunities that it may create. For example, increased demand for renewable energy, and using wind and solar as well as emerging opportunities in carbon capture and sequestration, as well the potential for the new hydrogen economy, could make these lands an important resource for such projects, replacing fossil fuel-derived energy, and limiting greenhouse gas increases."

– Mark Carney *(Vice Chair, Brookfield Asset Management, Head of ESG and Impact Fund Investing and UN Special Envoy on Climate Action and Finance)*[31]

Indigenous nations and communities are, in many respects, at the centre of the net zero transition and - in the Canadian and American contexts – may be the difference between success and failure to meet net zero targets.

Indigenous peoples have long understood the urgency of climate change and have not only been speaking out about the changes they have been seeing for decades[32] but have been spearheading new Indigenous-owned clean energy infrastructure.[33] Beginning with the fact that net zero projects will be hosted/built on Indigenous lands, the further centering of Indigenous peoples in net zero means that the balance of risks-benefits must be equitable, and with Indigenous nations as the decision makers.

There are three main drivers that underpin the central role of Indigenous nations in the clean energy sector and national net zero targets in the United States and Canada:

1. Indigenous Ownership: First, Indigenous nations in Canada and the United States, who have already been seeing the firsthand effects of climate change for decades, are spearheading solutions such as clean energy projects.[34] Increasingly over the last few years, Indigenous nations have been acquiring and building significant ownership in energy infrastructure projects such as clean energy generation, electrical transmission, and energy storage systems, as well as carbon offsets/sequestration projects (e.g., protection of forests on Indigenous lands for carbon credits, carbon capture utilization and storage).[35]

These Indigenous-led, and increasingly Indigenous equity-owned initiatives, are not only at the forefront of the global transition to net zero, but they are directly benefiting Indigenous nations and communities through both financial benefits and bettering local and global environments.

[31] First Nations Major Project Coalition, Roadmap to Investing in Canada: Indigenous Inclusion in ESG, Indigenous Sustainable Investment Conference Summary Report, May 2021.
[32] Watt-Cloutier, S. (2015). The right to be cold: One woman's story of protecting her culture, the arctic and the whole planet. Allen Lane.
[33] White A., Morrison, L. and Warrier, V. JWN Energy, February 28, 2022, "Equity investments by Indigenous communities in energy projects" https://www.jwnenergy.com/article/2022/2/28/equity-investments-by-indigenous-communities-in-en/.
[34] Indigenous Clean Energy, "Indigenous Clean Energy Projects", https://indigenouscleanenergy.com/.
[35] White A., Morrison, L. and Warrier, V. JWN Energy, February 28, 2022, "Equity investments by Indigenous communities in energy projects" https://www.jwnenergy.com/article/2022/2/28/equity-investments-by-indigenous-communities-in-en/.

2. Indigenous Lands: Second, is the inextricability of Indigenous peoples, knowledge, identities, and rights from their homelands – the same lands where effectively all net zero projects will be located and that net zero policies in will directly impact. Indigenous peoples have existed and thrived in their respective environments for millennia. The impact of climate mitigation projects is of vital importance to Indigenous nations and communities as it affects their lands, their present-day wellbeing, as well as future generations who will inherit the same responsibility for their places and lands.

3. Free, Prior, and Informed Consent: The third driver that centres Indigenous nations in net zero in Canada and the United States, is the legal imperative: Indigenous nations expect to not only be owners of net zero projects and but also to have free, prior, and informed consent as the baseline for any new projects, including those related to net zero. Both signatories to the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP), the United States and Canada's adherence to the Declaration includes, for example, Article 20(1):

> *Indigenous peoples have the right to maintain and develop their political, economic and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities.*

UNDRIP, alongside legal and socio-political precedents, has highlighted the risks (investment, project, and legal) posed to corporations[36] and governments[37] when they fail to secure the free, prior, and informed consent of Indigenous nations or whose lands/waters the project occurs. Without the full participation of Indigenous people, it is hard to conceive of net zero projects being completed in time to meet net zero target timelines.

[36] Golden, H., 15 Oct 2021, The Guardian, "Indigenous tribes tried to block a car battery mine. But the courts stood in the way." https://www.theguardian.com/environment/2021/oct/15/indigenous-tribes-block-car-battery-mine-courts.

[37] Friedman, L., 25 March 2020, The New York Times, "Standing Rock Sioux Tribe Wins a Victory in Dakota Access Pipeline Case" https://www.nytimes.com/2020/03/25/climate/dakota-access-pipeline-sioux.html.

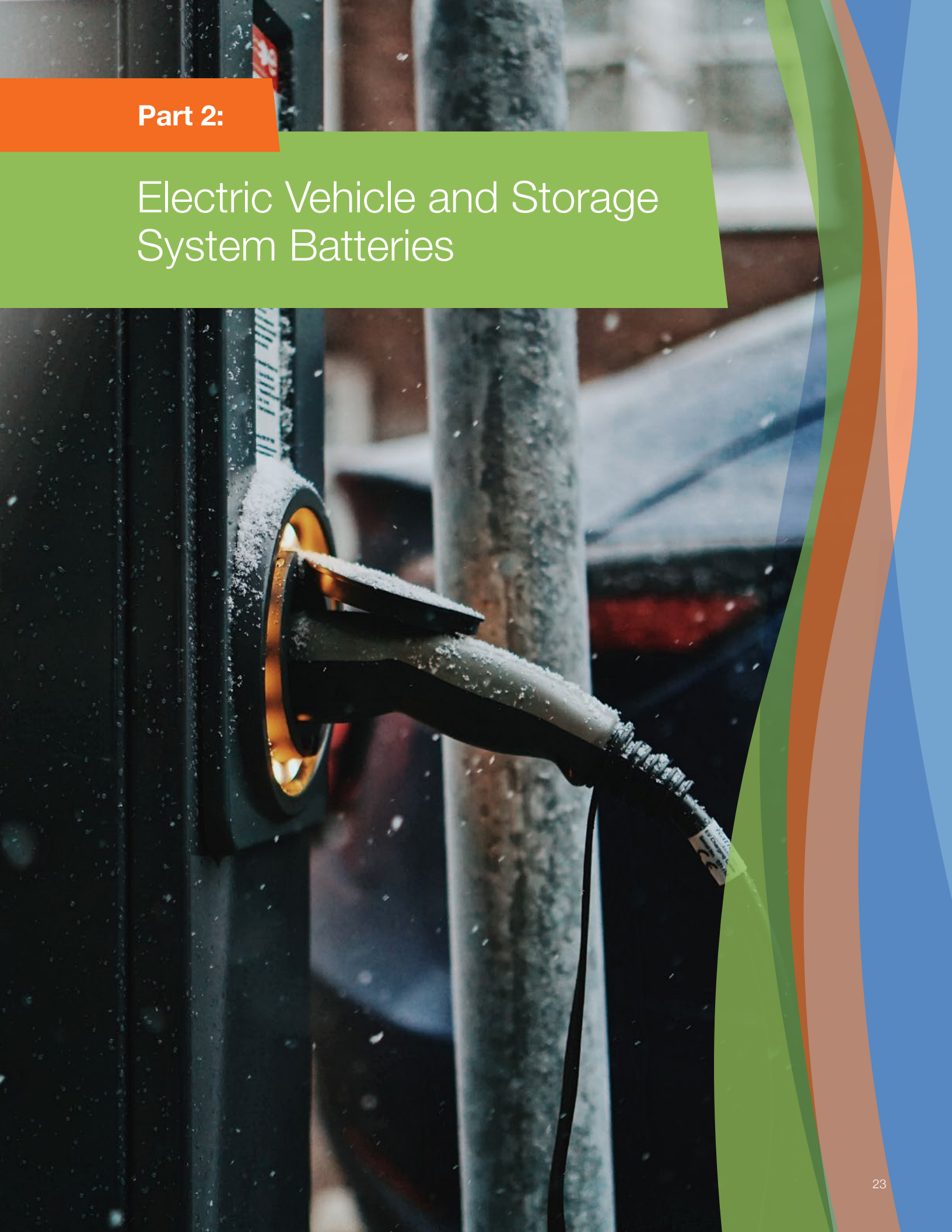
Indigenous nations seizing opportunities in net zero

Our collective society, Indigenous and non-Indigenous, Canadian and American, are facing the same threat, that of a changing climate that threatens our mutual interest of a sustainable world.

All of us, working together in the multitude of sectors focused on net zero innovations – e.g., clean energy generation, transmission, battery supply chains, policy, greenhouse gas offsets, and finance – are well-poised to benefit from the environmental and economic opportunities within the global energy transition. Indigenous nations and their traditional knowledge, lands, innovation, and yes, rights, are key to reach net zero targets.

In the sections that follow, this primer explores some of the areas of Indigenous-industry opportunity within the economic transition to net zero including:

- EVs and energy storage system batteries (Part 2);
- The clean energy transition (Part 3), and;
- ESG investment standards and net zero (Part 4).



Part 2:

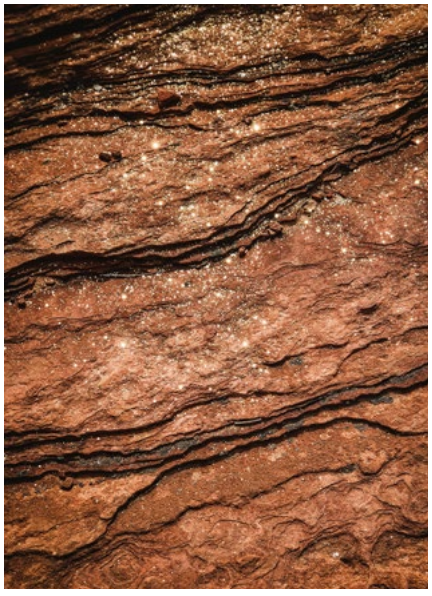
Electric Vehicle and Storage System Batteries

The battery minerals challenge ahead

One of the biggest challenges of meeting our global climate net zero targets is, and will continue to be, meeting the demand for the critical minerals required to build the batteries needed for clean energy technologies such as electric vehicles and electric storage systems.

"Advances in the production, use and reuse of batteries mean that the technology could become the most significant intervention to keep global warming within the limits set by the Paris Agreement on climate change between now and 2030." [38]

Low greenhouse[39] gas-emitting technologies such as electric vehicles (in particular their batteries), as well as solar and wind technologies, require more minerals and metals than their fossil fuel-based counterparts.[40] The projected global demand for clean energy technologies, specifically the production of battery critical metals and minerals, such as nickel, graphite, lithium, and cobalt, could increase by approximately 500% by 2050.[41] That equates to over three billion tons of minerals and metals needed to deploy the wind, solar, geothermal power, and energy storage required for meeting *Paris Agreement* targets.[42]



[38] Tedeneke, A. 19 Sep 2019, World Economic Forum, "Decade of the Battery: Sustainable Batteries Represent the Best Prospect for Meeting Paris Climate Goals" https://www.weforum.org/press/2019/09/decade-of-the-battery-sustainable-batteries-represent-the-best-prospect-for-meeting-paris-climate-goals/.

[39] The term low-emitting used here since there is "embodied carbon" inherent in the manufacture of new cars, including their batteries. Further, if electric cars are charged on a power grid that is fossil-fuel driven, then emissions remain part of their energy source.

[40] The World Bank, "Climate-Smart Mining: Minerals for Climate Action" https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action.

[41] The World Bank, May 11, 2020, "Mineral Production to Soar as Demand for Clean Energy Increases" https://www.worldbank.org/en/news/press-release/2020/05/11/mineral-production-to-soar-as-demand-for-clean-energy-increases.

[42] The World Bank, "Climate-Smart Mining: Minerals for Climate Action" https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action.

Where is the demand for battery metals and minerals coming from?

"The most important thing for the automotive sector as a whole is that you have a flourishing regional battery supply chain."[43]

The International Energy Agency is reporting that in 2020, the number of electric cars in the world hit 10 million, a staggering 43% increase from 2019.[44] Over the coming two decades, estimates are for there to be 300–500 million electric vehicles on the roads worldwide. All of those vehicles will require batteries.[45]

"We forecast that the market for battery cells will grow, on average, by more than 20 percent per year until 2030, reaching at least $360 billion globally. There is also a realistic scenario in which the market accelerates and hits $410 billion by 2030."

– McKinsey & Company, 2022[46]

In the United States in 2020, approximately 0.7% of passenger and fleet cars and trucks were electric, and this number is expected to grow to 31% vehicles by 2050.[47] US President Joe Biden has issued an executive order that half of all new vehicles sold in 2030 be zero-emissions vehicles.[48]

In Canada, the federal government has set a mandatory target that all new light-duty cars and passenger trucks sales must be zero-emission by 2035.[49] This growth of electric vehicles, and the required battery manufacturing for them, will be massive.

43 Perryman, A. Supply Chain Dive. March 4, 2021 "A growing appetite for EVs tasks the supply chain to scale" https://www.supplychaindive.com/news/electric-vehicle-battery-sourcing-material-manufacturing/596148/.

44 International Energy Agency. Global EV Outlook 2021. "Trends and developments in electric vehicle markets" https://www.iea.org/reports/global-ev-outlook-2021/trends-and-developments-in-electric-vehicle-markets.

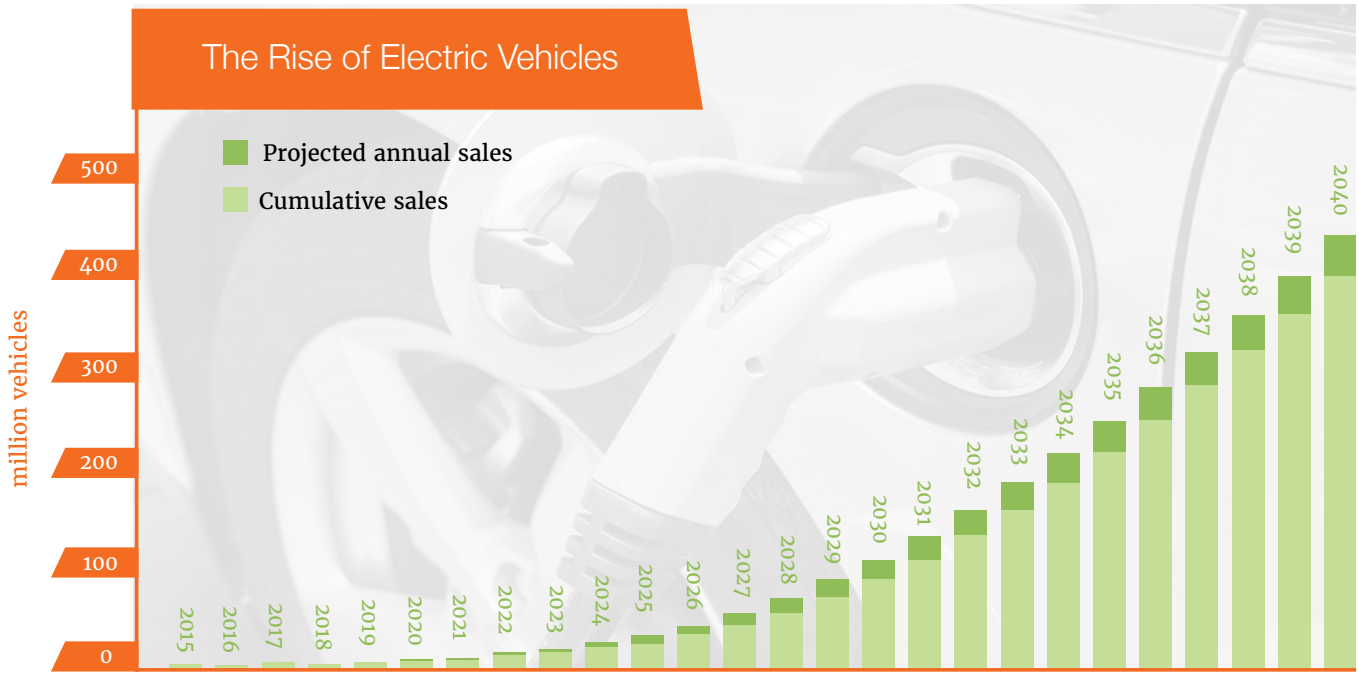
45 Picarsic, N., 23 November 2020. Automotive World. "Risky business: the hidden costs of EV battery raw materials" www.automotiveworld.com articles/risky-business-the-hidden-costs-of-ev-battery-raw-materials/.

46 Campagnol, N., Pfeiffer, A., and Tryggestad, C., McKinsey and Company. 7 January 2022. "Capturing the battery value-chain opportunity", www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/capturing-the-battery-value-chain-opportunity.

47 Lewis, M., Electrek. 26 October 2021. "Electric vehicles projected to make up 31% of the global fleet by 2050" https://electrek.co/2021/10/26/electric-vehicles-projected-to-make-up-31-of-the-global-fleet-by-2050/.

48 The White House. 05 August 2021. "FACT SHEET: President Biden Announces Steps to Drive American Leadership Forward on Clean Cars and Trucks". https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/.

49 Government of Canada. 29 June 2021. Press Release. "Building a green economy: Government of Canada to require 100% of car and passenger truck sales be zero-emission by 2035 in Canada" https://www.canada.ca/en/transport-canada/news/2021/06/building-a-green-economy-government-of-canada-to-require-100-of-car-and-passenger-truck-sales-be-zero-emission-by-2035-in-canada.html.



Source and infographic adapted from: Data compiled by Bloomberg New Energy Finance
www.bloombergquint.com/technology/the-relentless-march-toward-an-ev-future-is-good-news-for-miners

While electric vehicles have dominated the conversation about battery supply and demand, there is more to the story. Batteries used to store power will radically transform how we consume and generate electricity going forward. Outside of electric vehicles, battery storage is a central solution to the intermittent power generation of energy sources like solar, wind, and battery storage power systems.[50] Battery storage systems store generated energy, then allow the release of that energy from the storage system during peak demand.[51]

Oneida Energy Storage LP

In Southwestern Ontario, the Six Nations of the Grand River Development Corporation have partnered with NRStor Inc. to build a 250 megawatt / 1,000 megawatt-hour energy storage facility. "The facility is expected to provide significant benefits to Ontario's ratepayers by reducing the need and cost associated with using gas-fired power plants during times of peak demand. The project will help Ontario reduce greenhouse gas emissions by 4.1 million tonnes".[52]

[50] JD Supra. 16 November 2019. "Battery Supply Chain". https://www.jdsupra.com/legalnews/battery-supply-chain-27159/.
[51] National Grid. "What is Battery Storage?" https://www.nationalgrid.com/stories/energy-explained/what-is-battery-storage.
[52] Canada Infrastructure Bank. "Oneida Energy Storage" cib-bic.ca/en/projects/clean-power/oneida-energy-storage/.

The coming battery market

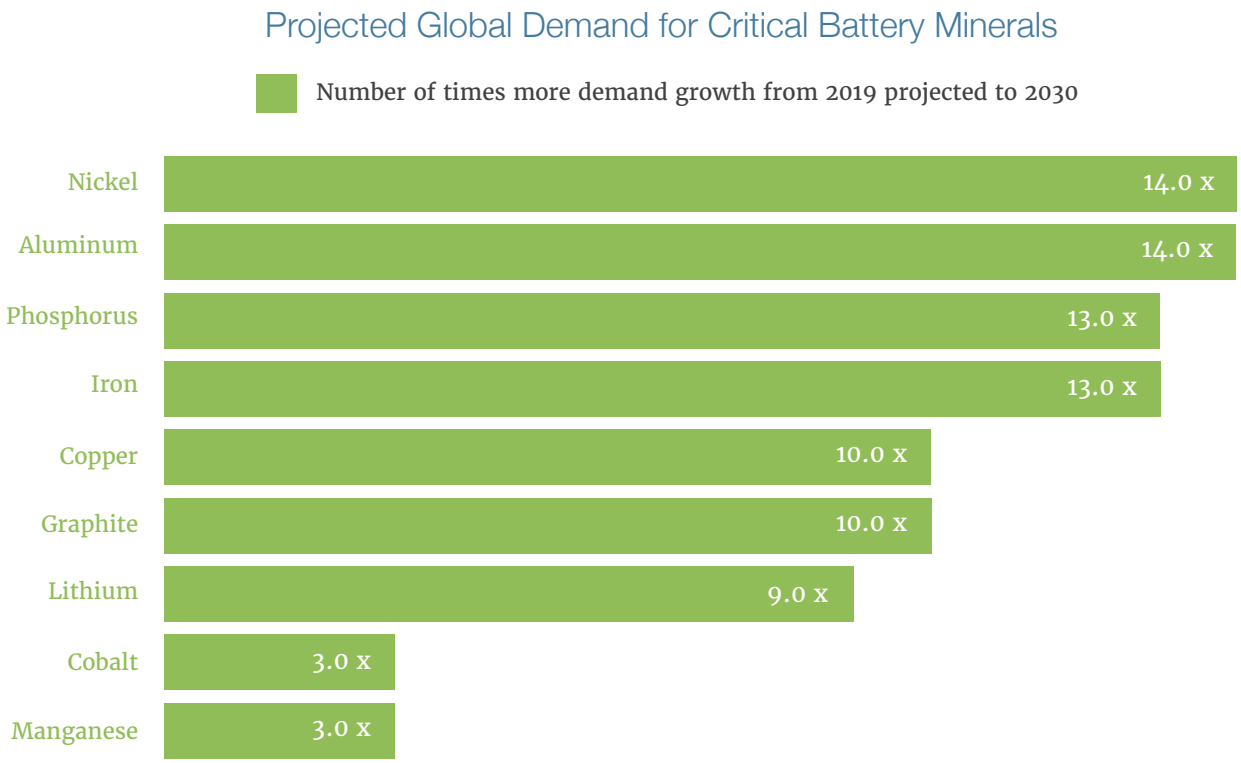
The lithium-ion battery market alone is expected to be worth $300 billion by 2030. The demand will grow even further from there: by 2050, the World Bank expects a 1,000% increase in the need for all battery metals.[53] The types of batteries used for electrical vehicles are: [54] [55]

Types of EV batteries

- Lithium-Ion Batteries
- Nickel-Metal Hydride Batteries
- Lead-Acid Batteries
- Ultracapacitors
- ZEBRA Batteries (uses sodium-sulfur)

The minerals in the names of these batteries, lithium, nickel, and lead, are only some of critical battery minerals required to make them. Additional critical battery minerals include aluminum, phosphorus, iron, copper, graphite, cobalt, and manganese.[56]

[53] Bennett, N., 24 August 2021. "Canada needs an EV battery supply chain strategy" https://biv.com/article/2021/08/canada-needs-ev-battery-supply-chain-strategy.
[54] US Department of Energy. Alternative Fuels Data Center. "Types of Energy Storage Systems". https://afdc.energy.gov/vehicles/electric_batteries.html.
[55] Omazaki Group. "Electric Car Batteries and Characteristics" https://www.omazaki.co.id/en/electric-car-batteries-and-their-characteristics/.
[56] Yue Li, Y., 06 Jul 2020. Bloomberg "Electric Vehicles Are Starting to Buoy the Global Metals Market Quint" www.bloombergquint.com/technology/the-relentless-march-toward-an-ev-future-is-good-news-for-miners.



Source and infographic adapted from: BloombergNEF
https://www.bloombergquint.com/technology/the-relentless-march-toward-an-ev-future-is-good-news-for-miners

The rub

The challenges to meeting this global battery mineral supply demand are threefold:

1. Global extraction and reuse of battery critical minerals is currently nowhere near what it needs to be yet to meet *Paris Agreement* targets;

2. If not done carefully, extraction of minerals/metals could continue to contribute considerably to greenhouse gas emissions (currently mining accounts for up to 11% of global energy use[57]) and thus reverse/cancel out the gains in greenhouse gas reductions, and;

3. Mineral/metal extraction must now be done ethically (for example in places like the Republic of the Congo where cobalt has been extracted under forced/child labour[58]) and with Indigenous consent (for decades, Indigenous lands in many cases have been mined without Indigenous free, prior, and informed consent, and in some cases with minimal or no benefit to Indigenous nations).

[57] World Bank Group. "Brief: Climate-Smart Mining: Minerals for Climate Action" https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action.
[58] Kelly, A., 16 Dec 2019. The Guardian. "Apple and Google named in US lawsuit over Congolese child cobalt mining deaths" https://www.theguardian.com/global-development/2019/dec/16/apple-and-google-named-in-us-lawsuit-over-congolese-child-cobalt-mining-deaths.

American and Canadian Roles in Battery Minerals/Metals Supply and Demand

The United States and Canada are each aggressively ramping up clean energy to meet their net zero targets – including electrical storage such as from solar generation (requires batteries) and electric vehicles (also requires batteries).

In the electric vehicle market alone, the Biden-Harris administration's multibillion dollar infrastructure plan (passed into law November 2021) will allocate some of those billions into EV infrastructure, EV batteries, and the EV market.[59] The Biden-Harris administration aims to convert the entire United States' government fleet of about 640,000 vehicles to electric, while California, the largest vehicle market in the US, plans to ban fossil fuel-powered engines entirely by 2035.[60]

In Canada, zero emission vehicle mandates (so far implemented in Québec and British Columbia), consumer awareness of the looming threat of climate change, and rising gas prices[61] have collectively driven demand.[62] The federal government has further encouraged demand for electric vehicles through point-of-sale rebate programs[63], and is increasingly supporting the demand for clean energy through initiatives like the Canada Greener Homes Grant[64] (driving up demand for technologies like roof-mounted solar panels on homes, some of which use batteries for energy storage).

Canada and the United States are dependent on each other in the energy transition to clean sources: Canada on the United States for its vehicle manufacturing as before, and going forward, the US on Canada for supplying critical battery minerals.

[59] The White House. 13 December 2021. "FACT SHEET: The Biden-Harris Electric Vehicle Charging Action Plan". www.whitehouse.gov/briefing-room/statements-releases/2021/12/13/fact-sheet-the-biden-harris-electric-vehicle-charging-action-plan/.

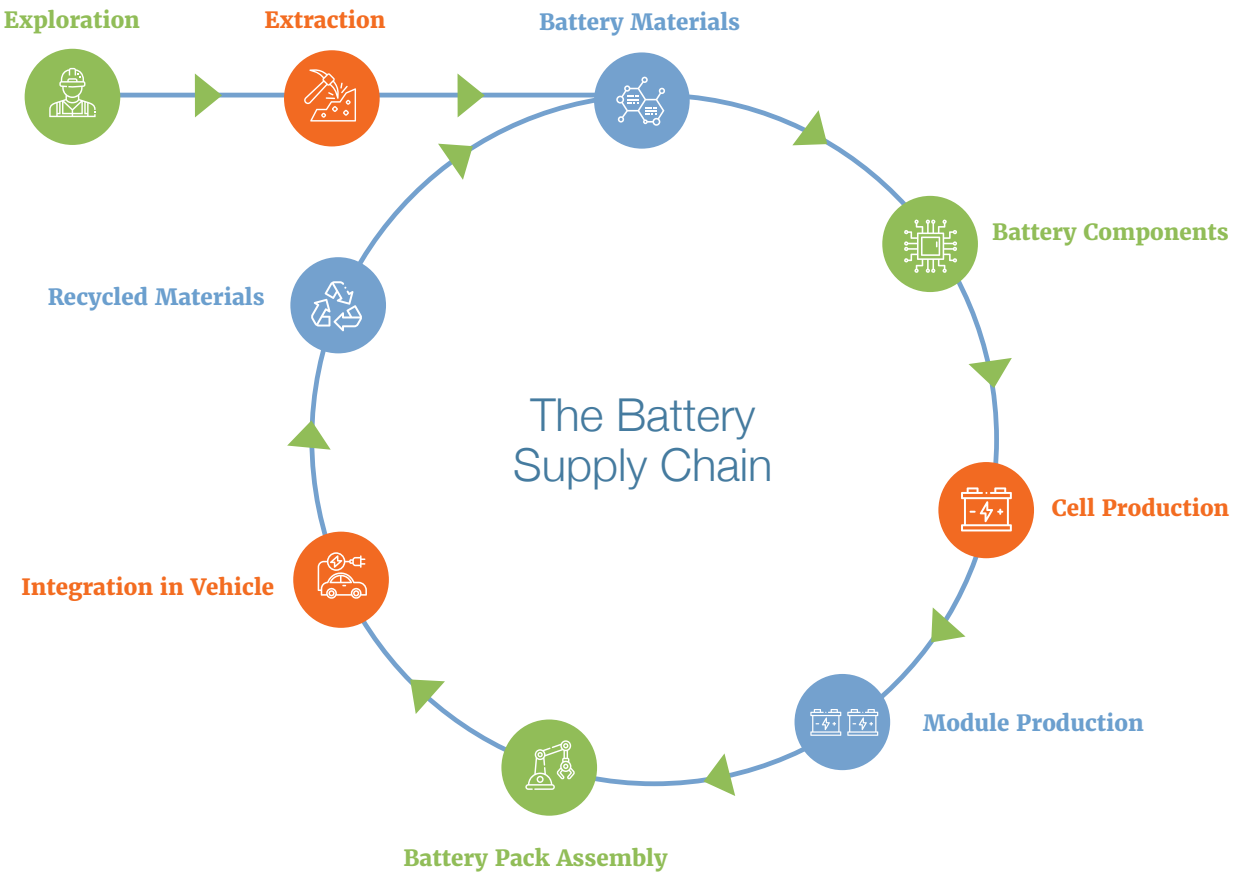
[60] Scheyder, E., 1 March 2021. Reuters. "To go electric, America needs more mines. Can it build them?" https://www.reuters.com/article/us-usa-mining-insight-idUSKCN2AT39Z.

[61] Hernandez, J., CBC News. 11 March 2022. "Gas prices fuel already hot electric vehicle demand in B.C. as wait-lists grow longer" https://www.cbc.ca/news/canada/british-columbia/gas-prices-fuel-already-hot-electric-vehicle-demand-in-b-c-as-wait-lists-grow-longer-1.6380840.

[62] Clean Energy Canada. 22 September 2020. "Media brief: What is a 'zero-emission vehicle standard' and why does Canada need one?" https://cleanenergycanada.org/media-brief-what-is-a-zero-emission-vehicle-standard-and-why-does-canada-need-one/.

[63] Government of Canada – Transport Canada. "Zero-emission vehicles". https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles.

[64] Government of Canada – Natural Resources Canada. "Canada Greener Homes Grant" https://www.nrcan.gc.ca/energy-efficiency/homes/canada-greener-homes-grant/23441.



Source and infographic adapted from: Clean Energy Canada
https://cleanenergycanada.org/wp-content/uploads/2021/05/Turning-Talk-into-Action_Building-Canadas-Battery-Supply-Chain.pdf

In early 2021, the United States Department of Energy warned that the country still lacks "sufficient domestic resources to meet expected demand for certain critical materials." Partnerships with allies such as Canada to build better supply chains and developing substitutes was one of the Department of Energy's recommendations.[65]

In terms of opportunity, Canada ranks fourth worldwide for having the required elements of a potential lithium-ion battery supply chain[66], and could become a supplier of choice to the US for reasons such as the ability to leverage mineral abundance, and to meet robust ESG standards.[67] The Canadian federal government has acknowledged the potential of the battery mineral supply sector and committed to a "mines to mobility" battery development strategy, and allocated $36.8 million in the 2021 budget to advance critical battery mineral processing and refining expertise.[68] [69]

[65] Bloomberg Green. 5 May 2021. "IEA Says Governments Should Consider Stockpiling Battery Metals" www.bloomberg.com/news/articles/2021-05-05/iea-says-governments-should-consider-stockpiling-battery-metals.
[66] Fasken. 9 September 2021. "The BMAC Report: Building a "Mines to Mobility" Battery Supply Chain" www.fasken.com/en/knowledge/2021/09/the-bmac-report-building-a-mines-to-mobility-battery-supply-chain.
[67] Fasken. 9 September 2021. "The BMAC Report: Building a "Mines to Mobility" Battery Supply Chain" www.fasken.com/en/knowledge/2021/09/the-bmac-report-building-a-mines-to-mobility-battery-supply-chain.
[68] Electric Economy. "Canada's battery supply chain holds huge potential, but the time to act is now: report" https://electricautonomy.ca/2021/05/20/canada-battery-supply-chain-report/.
[69] Note: Canada "has also invested $100 million in Lion Electric's battery module production facility in Québec and entered into a Joint Action plan on Critical Minerals with the U.S. government." Source: Ibid.

Canada's Opportunity

"Canada has a once-in-generation opportunity to establish itself as a major player in the global battery sector, but that window will close with or without us."

– Clean Energy Canada, *May 2021 Report: Turning Talk into Action: Building Canada's Battery Supply Chain*[70]

The United States and Canada are, and will increasingly be, intertwined in the supply chain of battery minerals/metals by virtue of proximity, trade partnerships, and existing supply chains. Yet, the economic opportunities within the sectors of each country are distinct. Canada's opportunities and competitive advantages can be seen in at least five main areas discussed below:

1. Indigenous leadership in the critical mineral supply chain
2. Known mineral deposits
3. Clean energy supply
4. Supply chain transparency
5. An integrated North American supply chain.

[70] Clean Energy Canada. May 2021 "Turning Talk into Action: Building Canada's Battery Supply Chain" https://cleanenergycanada.org/wp-content/uploads/2021/05/Turning-Talk-into-Action_Building-Canadas-Battery-Supply-Chain.pdf.

1. Indigenous leadership in the critical mineral supply chain

All battery metal/mineral extraction that occurs, or that will occur, in Canada is on lands and waters to which Indigenous nations and peoples have inherent and legal rights.[71]

The exponential growth of critical battery materials coincides with a rise in Indigenous-led equity participation in major projects including the clean energy sector.[72]

This change, is due to Indigenous leadership in:

1. Seeking equity ownership
2. The legal need for free, prior, and informed consent from Indigenous governments
3. Decision-making about major projects.[73]

This Indigenous leadership gives Indigenous nations, and ultimately Canada, a competitive advantage in the battery mineral supply chain in terms of ability to provide certainty to potential extraction projects. For Indigenous nations who choose to invite mineral extraction activities onto their traditional territories, they are well positioned to control the project timing, financial risks/benefits, environmental assessment, Indigenous values incorporation, and the land impacts on future Indigenous generations.

Canada has much to do to realize the opportunity that Indigenous leadership provides the country in terms of net zero economic and environmental opportunities. Just after the 2021 fall federal election, Canada announced a zero-emission supply chain alliance with 21 members.[74] However, among these members, none is an Indigenous organization[75] – an oversight that weighs heavily against the potential success and legitimacy of the alliance.

Oceti Sakowin Power Project

[71] United Nations Department of Economic and Social Affairs. "United Nations Declaration on the Rights of Indigenous Peoples" www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html.
[72] Canadian Institute for Climate Choices and Indigenous Clean Energy. February 2022. "Waves of Change: Indigenous clean energy leadership for Canada's clean, electric future" climateinstitute.ca/wp-content/uploads/2022/02/ICE-report-ENGLISH-FINAL.pdf.
[73] First Nations Major Project Coalition, Roadmap to Investing in Canada: Indigenous Inclusion in ESG, Indigenous Sustainable Investment Conference Summary Report, May 2021.
[74] Electric Economy. 01 October 2021. "Canada's ZEV supply chain alliance launches under Accelerate banner" https://electricautonomy.ca/2021/10/01/accelerate-zev-supply-chain-alliance/.
[75] Accelerate: Canada's ZEV Supply Chain Alliance. https://acceleratezev.ca/our-members/.

First Tellurium and Cheona Metals Inc. Critical Minerals Project.

First Tellurium and Cheona Metals Inc.

First Tellurium's Deer Horn project in British Columbia will produce tellurium, a critical metal for solar panels and solid-state lithium-tellurium batteries.[76] The project takes a small mine approach driven by Indigenous support.[77] First Tellurium is an equity partner in Indigenous-owned mineral explorer Cheona Metals Inc. First Tellurium is a pending member of the Initiative for Responsible Mining Assurance (IRMA).[78]

[76] First Tellurium. "Home". https://www.firsttellurium.com/.
[77] First Tellurium. "Our Small Mine Approach". www.firsttellurium.com/projects/deer-horn/our-small-mine-approach.
[78] Initiative for Responsible Mining Assurance. "About Us". https://responsiblemining.net/about/about-us/.

2. Known mineral deposits

Canada has known deposits of the minerals and metals needed for clean energy technologies. Canada's deposits include some of the most important battery raw materials including nickel, lithium, cobalt, graphite, copper, and manganese. Further, Canada has been touted as having "sizable potential to be one of the global leaders of (sic) upstream of the lithium ion battery ecosystem that the world is beginning to build out."[79] However, of the five battery minerals that are needed for lithium-ion batteries (cobalt, graphite, lithium, manganese and nickel) all are found in Canada, but many are not actively produced.[80] "Unlocking" Canada's mineral deposit potential will be crucial going forward, and will depend largely on the interest of Indigenous nations' lands within which these metal/mineral deposits lay. The Battery Metals Association of Canada recommends that in addition to mining deposits, Canada's focus should be in processing, smelting, and refining, and some battery component manufacturing.[81]

3. Clean energy supply

"When you look at a value for Canada, you have that low-carbon mineral production, which is very complementary to what the whole transition is trying to achieve in the first place, but we also have that added supply chain security because of our proximity to the U.S. market. The U.S. has the single largest vehicle-per-capita density country anywhere in the world. So if you're a U.S. manufacturer and you can source these materials competitively on a cost-competitive basis from Canada, you'll just do that."[82]

- Brendan Marshall, *Vice-President of Economic and Northern Affairs for the Mining Association of Canada*

Canada has a relatively abundant clean energy supply, in particular hydroelectric, to lower the greenhouse gas emissions from critical mineral mining. Canada's ability to potentially lower or eliminate greenhouse emissions from critical mining is important as automakers of electric vehicles are increasingly looking to reduce emissions for all aspects of manufacture and lifecycle.[83] Hydroelectricity in some provinces can provide energy sources for mining (e.g., electric mining fleets) and smelting.

[79] Globe Newswire. 19 February 2021. "Benchmark Mineral Intelligence to appear before Canada's House of Commons to speak on electric vehicle and battery supply chains" https://www.globenewswire.com/news-release/2021/02/19/2178919/0/en/Benchmark-Mineral-Intelligence-to-appear-before-Canada-s-House-of-Commons-to-speakon-electric-vehicle-and-battery-supply-chains.html.
[80] Bennett, N., 24 August 2021. "Canada needs an EV battery supply chain strategy" https://biv.com/article/2021/08/canada-needs-ev-battery-supply-chain-strategy.
[81] Ibid.
[82] Ibid.
[83] Clean Energy Canada. May 2021 "Turning Talk into Action: Building Canada's Battery Supply Chain". https://cleanenergycanada.org/wp-content/uploads/2021/05/Turning-Talk-into-Action_Building-Canadas-Battery-Supply-Chain.pdf.

4. Supply chain transparency

"Companies using materials that cannot guarantee an ethical [battery mineral] supply chain will increasingly come under pressure as consumer demand for sustainably sourced products grows."[84]

Consumers and investors are increasingly demanding an ethical supply of minerals (including clean energy mineral/metal extraction,[85] [86] elimination of child and forced labour,[87] and consent of Indigenous nations/leadership[88]) which cannot be provided by all countries. As a result, automakers are scrambling to secure a sustainable and ethical supply of battery minerals/metals, e.g., copper, nickel, lithium, cobalt.[89]

The Global Battery Alliance, in partnership with the World Economic Forum, has created a battery passport to convey information to consumers about environmental-social-governance (ESG) standards and lifecycle requirements.[90] Compared to other areas, such as the Congo where the mining of cobalt has gained attention for having reportedly occurred under some dubious or unethical means, Canada's trustworthiness in terms of reliable consumer and investor reporting is a key aspect of its potential competitive advantage in the realm of critical mineral supply.

[84] JD Supra. 16 November 2019. "Battery Supply Chain". https://www.jdsupra.com/legalnews/battery-supply-chain-27159//.
[85] EverLedger. "Clean Technologies Have More Complicated Mineral Requirements Than Fossil Fuels: A Critical Commitment To Transition Critical Minerals" https://everledger.io/clean-technologies-have-more-complicated-mineral-requirements-than-fossil-fuels-a-critical-commitment-to-transition-critical-minerals/.
[86] Vasil, A., 20 January 2020. Corporate Knights. "The EV revolution will take batteries, but are they ethical?" https://www.corporateknights.com/mining/ev-revolution-needs-batteries-ethical/.
[87] Tedeneke, A. 19 Sep 2019, World Economic Forum, "Decade of the Battery: Sustainable Batteries Represent the Best Prospect for Meeting Paris Climate Goals" https://www.weforum.org/press/2019/09/decade-of-the-battery-sustainable-batteries-represent-the-best-prospect-for-meeting-paris-climate-goals/.
[88] Frankel, T.C., and Whoriskey, P., 19 December 2016. The Washington Post. "Tossed Aside in the 'White Gold' Rush: Indigenous people are left poor as tech world takes lithium from under their feet" https://www.washingtonpost.com/graphics/business/batteries/tossed-aside-in-the-lithium-rush/.
[89] JD Supra. 16 November 2019. "Battery Supply Chain". https://www.jdsupra.com/legalnews/battery-supply-chain-27159//.
[90] Global Battery Alliance. November 2020. Briefing Paper, "The Global Battery Alliance Battery Passport: Giving an identity to the EV's most important component" www3.weforum.org/docs/WEF_GBA_Battery_Passport_Overview_2021.pdf.

5. Already integrated North American vehicle supply chain

"With $2.6-billion worth of goods and services moving between Canada and the U.S. every day, both of our economies are better off when we work together."

- The Honourable Seamus O'Regan, *Canada's Minister of Natural Resources*[91]

The United States and Canada do not have to reinvent the wheel in terms of the vehicle supply chain to move forward. These two countries have long had an integrated vehicle supply chain, which gives Canada a leg-up on the electrical vehicle supply chain as it grows. The United States and Canada now have established a *Joint Action Plan on Critical Minerals Collaboration*, created to advance the mutual interests of both countries to secure supply chains for the critical minerals needed for important manufacturing sectors, including clean technology.[92]

In concert, these five competitive advantages amount to the potential for Canada to become a "leading supplier of sustainable battery materials and a producer of cutting-edge technology."[93]

[91] Government of Canada – Natural Resources Canada. 9 January 2020. News Release. "Canada and U.S. Finalize Joint Action Plan on Critical Minerals Collaboration" https://www.canada.ca/en/natural-resources-canada/news/2020/01/canada-and-us-finalize-joint-action-plan-on-critical-minerals-collaboration.html.

[92] Ibid.

[93] Clean Energy Canada. May 2021 "Turning Talk into Action: Building Canada's Battery Supply Chain". https://cleanenergycanada.org/wp-content/uploads/2021/05/Turning-Talk-into-Action_Building-Canadas-Battery-Supply-Chain.pdf.

USA's Opportunity

The United States has an opportunity, and arguably urgent need, to secure a strong domestic battery supply for its auto manufacturing sector which is quickly ramping up its electric vehicle production. The opportunities and competitive advantages for the United States can be seen in at least the main areas of (1) Indigenous/Tribal leadership, (2) auto manufacturing dominance, (3) domestic supply chains, (4) decisive federal support for battery mineral supply, and (5) recycling/harvesting potential. The competitive advantage of each of these is discussed briefly below.

1. Indigenous/Tribal Leadership

Any battery mineral extraction that occurs now or in the future in the United States is on Indigenous lands. As with Canada, Indigenous nations/tribes in the United States are accessing and deploying a rapidly growing amount of capital and equity investment in major infrastructural and other projects, amounting to Indigenous leadership in the forms of (a) equity ownership, (b) free, prior, and informed consent from Indigenous governments and hereditary leadership, and (c) decision making about projects.[94] In the United States, the Department of Interior, with the support of the White House Office of Science and Technology Policy, has established a working group to identify sites where battery minerals could be produced/processed in the United States. The working group has committed to working with Indigenous/Tribal nations among others and to "meaningful community engagement and consultation with Indigenous/Tribal nations, respecting the government-to-government relationship at all stages of the mining process."[95] However, mineral extraction on Tribal lands must be approached with caution: many Indigenous/Tribal nations are in active opposition to some mines (e.g., Nez Perce, Idaho - Perpetua Resources (antimony) - Stibnite Gold Project[96] and Shoshone-Paiute - Lithium Nevada[97]).

2. Auto manufacturing dominance

In North America, the United States dominates automobile manufacturing sector by a long shot – in fact Canada has no domestic original equipment manufacturer for passenger vehicles.[98] As American auto manufacturers increase their production of electric vehicles, and given the high barrier to entry in the auto sector, there is potential for the United States to further consolidate their market dominance. This opportunity for American auto manufacturers to realize/maintain market dominance in electric vehicles is dependent upon whether they can secure critical battery minerals for manufacturing.

94 First Nations Major Project Coalition, Roadmap to Investing in Canada: Indigenous Inclusion in ESG, Indigenous Sustainable Investment Conference Summary Report, May 2021.
95 Green Car Congress. 09 June 2021. "Biden Administration reports highlight supply chain vulnerabilities for batteries, critical materials" https://www.greencarcongress.com/2021/06/20210609-supplychain.html.
96 Healy, J. and Baker, M. 27 December 2021. New York Times. "As Miners Chase Clean-Energy Minerals, Tribes Fear a Repeat of the Past" https://www.nytimes.com/2021/12/27/us/mining-clean-energy-antimony-tribes.html.
97 NPR. 2 September 2021. "These Tribal Activists Want Biden To Stop A Planned Lithium Mine On Their Sacred Land" www.npr.org/2021/09/02/1031726626/these-tribal-activists-want-biden-to-stop-a-planned-lithium-mine-on-their-sacred.
98 Clean Energy Canada. May 2021 "Turning Talk into Action: Building Canada's Battery Supply Chain". https://cleanenergycanada.org/wp-content/uploads/2021/05/Turning-Talk-into-Action_Building-Canadas-Battery-Supply-Chain.pdf.

3. Domestic supply chains diversification from sector domination of battery mineral supply

The United States, among other regions manufacturing electric vehicles, is aware of its dependence on China for battery and battery mineral supply.[99] Electric vehicle manufacturers Audi and Jaguar Land Rover, whose production was halted by battery supply bottlenecks and unavailable key battery ingredients such as lithium and cobalt, have already felt the cost of the vulnerability of undiversified supply sources of critical minerals.[100] Within this vulnerability of geographic concentration of global sourcing[101] is an opportunity for the United States to secure its own domestic supply chains of battery minerals (which is already underway). The Biden-Harris administration has earmarked US$100 million for apprenticeship programs to build workforces for new domestic supply chains.[102] In the private sector and also in response to China's dominance in the battery supply chain, General Motors announced its goal to source both lithium and nickel from North America for its electric cars.[103] As with Canada, the United States' window to supply the battery mineral supply chain with critical minerals from domestic sources has been flagged as an opportunity, and is underway.

4. Decisive federal government support for battery mineral supply

Although Canada's roadmap on battery mineral supply chains is slowly coming together, the United States has the strategic advantage of decisive federal support for building supply chains from the very top. The Biden-Harris White House announced an executive order in early 2021 which included a risk assessment of the supply chain for "high-capacity batteries, including electric-vehicle batteries, and policy recommendations to address these risks"[104]. In June 2021, the White House announced a task force to address short-term supply chain discontinuities, including a mandate to secure an "end-to-end domestic supply chain for advanced batteries".[105] This decisive action by the federal government gives the United States a considerable competitive advantage in the race to get a foothold in the otherwise geographically concentrated battery mineral supply chain.

99 Ibid.
100 Cohen, A., 25 March 2020. "Manufacturers Are Struggling To Supply Electric Vehicles With Batteries" https://www.forbes.com/sites/arielcohen/2020/03/25/manufacturers-are-struggling-to-supply-electric-vehicles-with-batteries/?sh=645935511ff3.
101 Green Car Congress. 09 June 2021. "Biden Administration reports highlight supply chain vulnerabilities for batteries, critical materials" https://www.greencarcongress.com/2021/06/20210609-supplychain.html.
102 The Verge. 8 June 2021. "The US wants to fix its broken lithium battery supply chain" https://www.theverge.com/2021/6/8/22524663/us-lithium-battery-supply-chain-broken.
103 Cohen, A., 25 March 2020. "Manufacturers Are Struggling To Supply Electric Vehicles With Batteries" https://www.forbes.com/sites/arielcohen/2020/03/25/manufacturers-are-struggling-to-supply-electric-vehicles-with-batteries/?sh=645935511ff3.
104 The White House. 24 February 2021. "Executive Order on America's Supply Chains" www.whitehouse.gov/briefing-room/presidential-actions/2021/02/24/executive-order-on-americas-supply-chains/.
105 The White House. 8 June 2021. "FACT SHEET: Biden-Harris Administration Announces Supply Chain Disruptions Task Force to Address Short-Term Supply Chain Discontinuities" https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/08/fact-sheet-biden-harris-administration-announces-supply-chain-disruptions-task-force-to-address-short-term-supply-chain-discontinuities/.

5. Recycling/Harvesting

As demand for battery minerals has grown, so too has the focus on the "circular economy", including battery mineral recycling/harvesting. The United States could massively grow this area over the coming decades to meet 2030 and 2050 net zero commitments. The United States Department of Energy has already mandated recycling so that battery makers can ultimately harvest more materials from used products.[106] This federal mandate, coupled with projected demand, creates an opening for the American economy to build a self-sustaining battery mineral supply chain to deemphasize reliance on mining to obtain battery minerals and instead source some of the minerals from used batteries.

Already underway, Redwood Materials (Nevada) has partnered with Panasonic to recycle the battery waste from Tesla's Gigafactory – an example of treating batteries (and the minerals within them) like any other commodity.[107]

By 2030, recycling could provide approximately 13% of global demand for cobalt, 5% of nickel and 9% of lithium, market shares that will grow as the surge of today's batteries reach their end of life.[108] In addition to being an opportunity for the United States, building the recycling part of the battery supply chain is a potential opportunity for interested Indigenous nations/Tribes in the United States as well.

[106] The Verge. 8 June 2021. "The US wants to fix its broken lithium battery supply chain" https://www.theverge.com/2021/6/8/22524663/us-lithium-battery-supply-chain-broken.

[107] Perryman, A. Supply Chain Dive. March 4, 2021 "A growing appetite for EVs tasks the supply chain to scale" https://www.supplychaindive.com/news/electric-vehicle-battery-sourcing-material-manufacturing/596148/.

[108] Tedeneke, A. 19 Sep 2019, World Economic Forum, "Decade of the Battery: Sustainable Batteries Represent the Best Prospect for Meeting Paris Climate Goals" https://www.weforum.org/press/2019/09/decade-of-the-battery-sustainable-batteries-represent-the-best-prospect-for-meeting-paris-climate-goals/.

Barrier Analysis - Canada

Canada's opportunity to act in the battery mineral and metal supply chain is now, and yet the barriers to realization of this opportunity are formidable. Canada's barriers to gaining a strong foothold in the battery mineral supply chain include:

- **Indigenous involvement:** The centralization of Indigenous leadership in the battery supply chain planning and actualization needs to happen while projects are in their initial planning phases, not after the fact or later in project implementation.
- **Remoteness:** The relative remoteness of resources in Canada leads to higher costs for exploration.[109]
- **Lead times:** Relatively long-lead times from exploration to production.[110]
- **Investment:** The battery critical mineral supply industry needs a wider reach of investors to fund early-stage developments.[111]
- **Limited critical metal exploration yet underway:** The end-of-life of Canada's currently in-use nickel and cobalt batteries are estimated at 12 years (as of 2021).[112]
- **Regulatory climate:** Getting a new Canadian mine approved and in production can be a decades-long process.[113]
- **Refining capacity:** Canada lacks much of the refining and chemical processing capacity related to battery grade materials,[114] and lacks refining capacity to make battery-grade nickel-sulphate.[115]
- **Price volatility:** There are several geopolitical vulnerabilities that have the potential to hinder the adequate supply of critical battery minerals leading to commodity price volatility.[116]
- **China's market domination:** China has a formidable slice of the global battery mineral supply sector, thus making it more difficult for Canada to compete. In 2019, China processed "65% of the world's nickel, 82% of the world's cobalt, 93% of manganese supply and 59% of the world's lithium and graphite supply."[117]

[109] Fasken. 9 September 2021. "The BMAC Report: Building a "Mines to Mobility" Battery Supply Chain" www.fasken.com/en/knowledge/2021/09/the-bmac-report-building-a-mines-to-mobility-battery-supply-chain.
[110] Ibid.
[111] Ibid.
[112] Ibid.
[113] Bennett, N., 24 August 2021. "Canada needs an EV battery supply chain strategy" https://biv.com/article/2021/08/canada-needs-ev-battery-supply-chain-strategy.
[114] Clean Energy Canada. May 2021 "Turning Talk into Action: Building Canada's Battery Supply Chain". https://cleanenergycanada.org/wp-content/uploads/2021/05/Turning-Talk-into-Action_Building-Canadas-Battery-Supply-Chain.pdf.
[115] Bennett, N., 24 August 2021. "Canada needs an EV battery supply chain strategy" https://biv.com/article/2021/08/canada-needs-ev-battery-supply-chain-strategy.
[116] International Energy Agency. "Net Zero by 2050 A Roadmap for the Global Energy Sector" July 2021. https://iea.blob.core.windows.net/assets/beceb956-0dcf-4d73-89fe-1310e3046d68/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf.
[117] Fasken. 9 September 2021. "The BMAC Report: Building a "Mines to Mobility" Battery Supply Chain" www.fasken.com/en/knowledge/2021/09/the-bmac-report-building-a-mines-to-mobility-battery-supply-chain.

Barrier Analysis - USA

The United States has a related but slightly different set of barriers than those in Canada. The United States' barriers to securing a reliable battery mineral supply chain include:

- **Indigenous/Tribal involvement**: As in Canada, the centering of Indigenous/Tribal leadership in the battery supply chain needs to happen as it is reformulated/created, not after the fact or later in the process.

- **Lack of national strategy:** Despite the White House's recent efforts to correct it, the United States still lacks a comprehensive national strategy to address the looming and urgent shortage of battery minerals.[118]

- **Concentrated overseas battery mineral supply:** The concentrated supply of battery minerals overseas, primarily China, introduces a single point of values for supply chain disruption and vulnerability to American battery and vehicle manufacturing.[119]

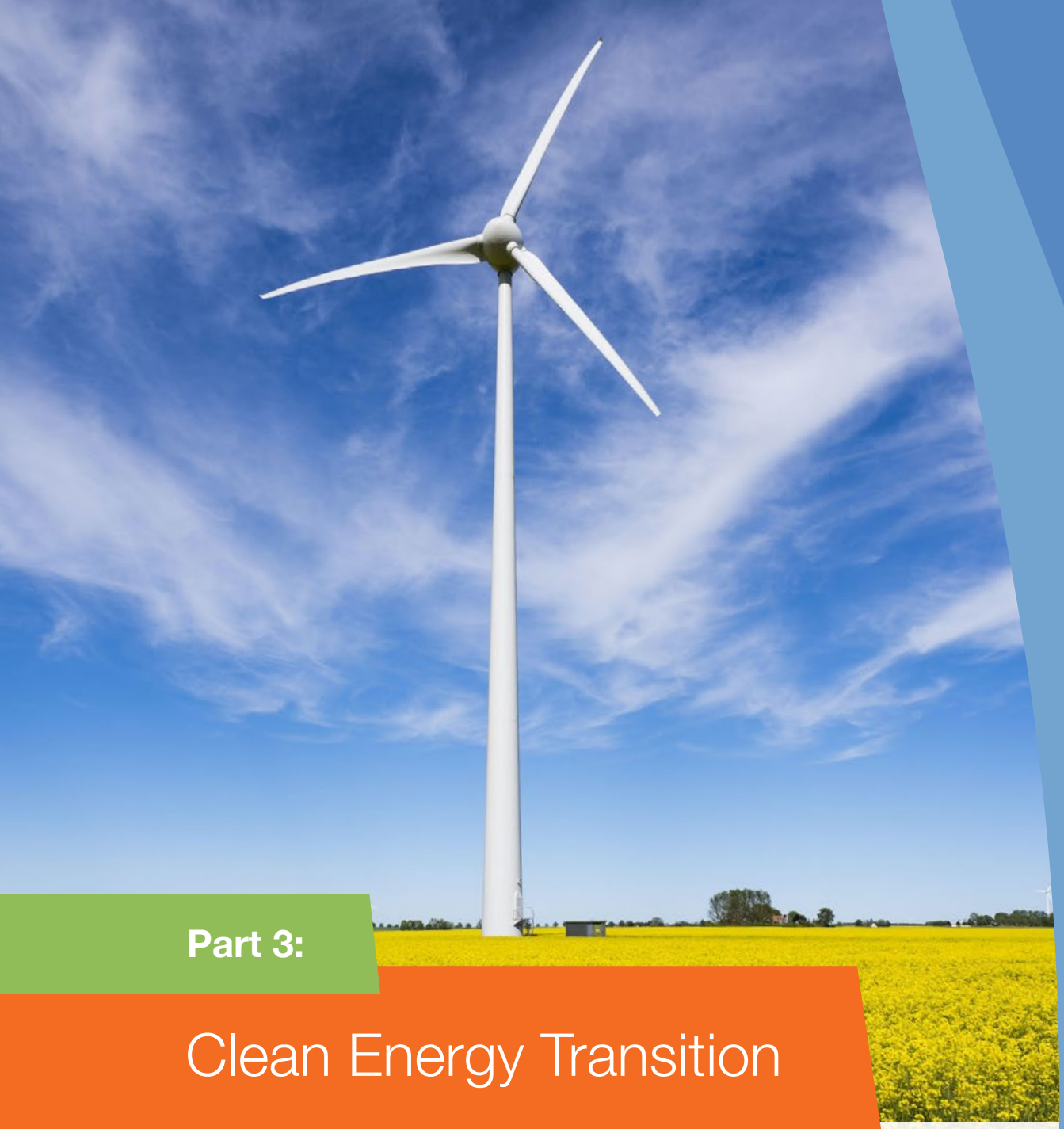
- **Labour shortages:** Labour shortages created by COVID-19, accompanied by high production costs and logistical shortcomings, have delayed existing battery mineral supply and therefore manufacture of clean energy technologies such as electric vehicles.[120]

- **Battery recycling barriers:** For battery mineral recycling in the United States, barriers to battery recycling include a lack of technology, the cost of recycling being higher than new production, and few existing used batteries that have reached their end-of-life.[121]

"We'll fail as an industry if we focus too much on lowest-cost sourcing at any cost for the cheapest possible internationally imported battery as if it were just another commodity like a wheel nut...If we do that, we're not going to grow a sustainable supply chain, and the long-term value will be eroded."[122]

– James Nicholson, *Partner, EY-Parthenon*

[118] The Verge. 8 June 2021. "The US wants to fix its broken lithium battery supply chain" https://www.theverge.com/2021/6/8/22524663/us-lithium-battery-supply-chain-broken.
[119] Automotive World. 23 November 2020. "Risky business: the hidden costs of EV battery raw materials" https://www.automotive-world.com/articles/risky-business-the-hidden-costs-of-ev-battery-raw-materials/.
[120] Cohen, A., 25 March 2020. "Manufacturers Are Struggling To Supply Electric Vehicles With Batteries" https://www.forbes.com/sites/arielcohen/2020/03/25/manufacturers-are-struggling-to-supply-electric-vehicles-with-batteries/?sh=645935511ff3.
[121] Fasken. 9 September 2021. "The BMAC Report: Building a "Mines to Mobility" Battery Supply Chain" www.fasken.com/en/knowledge/2021/09/the-bmac-report-building-a-mines-to-mobility-battery-supply-chain.
[122] Perryman, A. Supply Chain Dive. March 4, 2021 "A growing appetite for EVs tasks the supply chain to scale" https://www.supplychaindive.com/news/electric-vehicle-battery-sourcing-material-manufacturing/596148/.



Part 3:

Clean Energy Transition

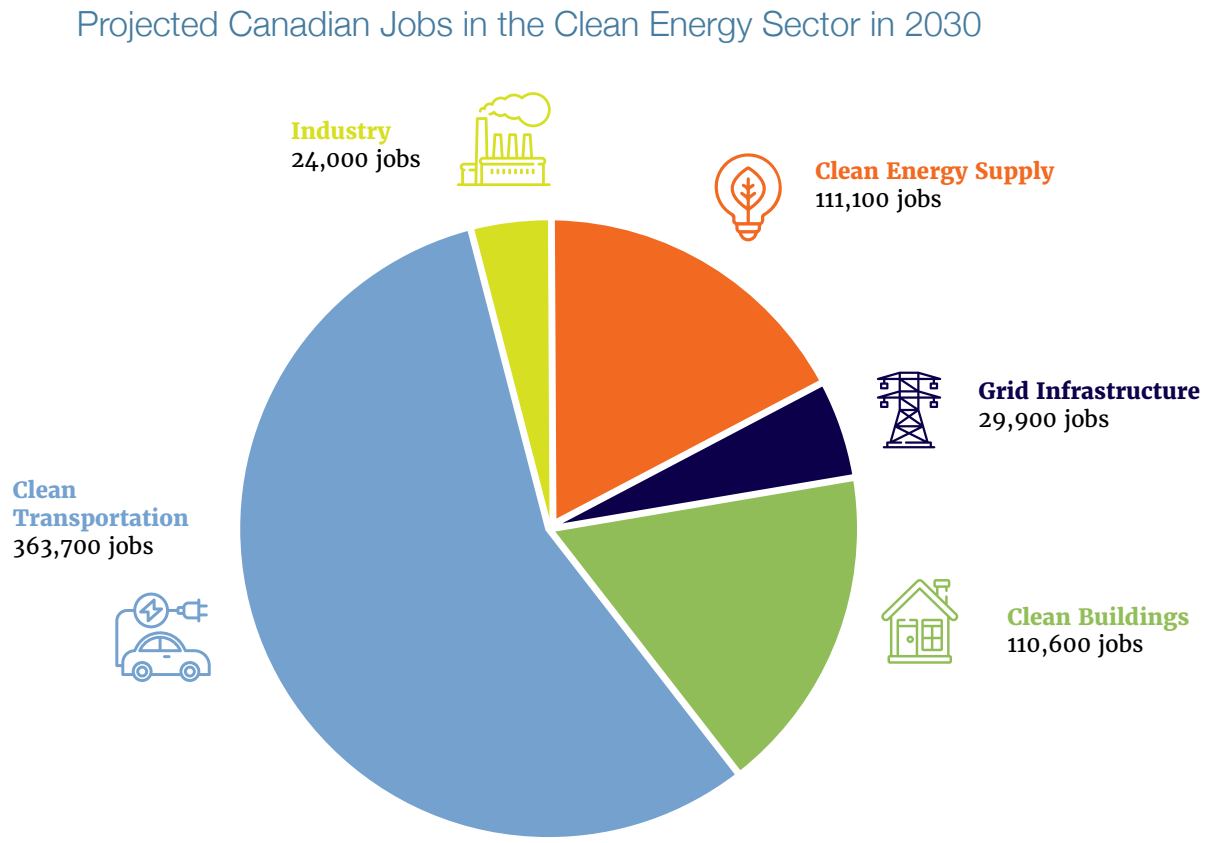
"Solar and wind are now the cheapest bulk power sources in 91% of the world, and the UN's International Energy Agency (IEA) expects renewables to generate 90% of all new power in the coming years. **The energy revolution has happened. Sorry if you missed it.**"

– Dr. Amory Lovins, *Civil and Environmental Engineering, Stanford University*[123]

[123] Vidal, J. 26 Mar 2022. The Guardian. "Energy efficiency guru Amory Lovins: 'It's the largest, cheapest, safest, cleanest way to address the crisis" https://amp-theguardian-com.cdn.ampproject.org/c/s/amp.theguardian.com/environment/2022/mar/26/amory-lovins-energy-efficiency-interview-cheapest-safest-cleanest-crisis.

Clean Energy Supply and Transmission

Countries around the world collectively added approximately 290 gigawatts of clean power capacity in 2021, according to the International Energy Agency (IEA), setting an "all-time record for new installations." The IEA forecasts that the planet's renewable electricity capacity will "jump to more than 4,800 GW by the year 2026, an increase of over 60% compared with 2020 levels."[124]



Infographic adapted from and source: Clean Energy Canada, June 2021, "The New Reality" https://cleanenergycanada.org/wp-content/uploads/2021/06/Report_CEC_CleanJobs2021.pdf

Clean energy generation is the supply/generation of energy (for anything from transportation to heating) that comes from renewable sources that do not emit greenhouse gases into the earth's atmosphere when used.[125] Typical examples include wind turbines, solar panels and hydroelectric generation. This approach to generating energy differs from its fossil fuel (e.g., coal, oil, and gas) counterparts which emit greenhouse gases into the earth's atmosphere and worsen global heating. The following sections of this primer explore the main technologies and possibilities that are being considered today and that are most relevant to Indigenous nations in Canada and the United States.

[124] Frangoul, A., 1 December 2021. CNBC. "IEA says renewable power installations are set for a record year, warns of net-zero uncertainty" www.cnbc.com/2021/12/01/renewable-power-installations-set-for-record-year-iea.html.
[125] TWI. "What is clean energy? How does it work? Why is it so important?" https://www.twi-global.com/technical-knowledge/faqs/clean-energy.

Solar/Photovoltaic Power Generation

Generally known as solar farms or solar power plants, photovoltaic power stations are emerging rapidly around the world, including within Indigenous nations in the United States and Canada. Solar power generation uses solar panels to convert light directly to electricity, and that electricity in many cases is sold back to the existing power grid. (Exception: in some remote communities, solar power may only supply or supplement/offset the existing community power source such as fossil fuels and where powerlines do not reach). In smaller communities, grid-tied solar power plants are useful for offsetting greenhouse gas-emitting power generation such as coal- or gas-fired electrical power plants as well as selling back excess power to the main power grid for revenues.

Role of Solar Electric Generation in Net Zero

Solar electric generation infrastructure, ranging from small household grids and microgrids to large-scale solar power farms, is playing a rapidly increasing role in replacing fossil fuel generated electricity in the United States and Canada. In particular, solar plays the following role in net zero targets:

1. Replacing or reducing fossil fuel-dependent electrical generation.
2. Replacing or reducing the dependence by small or remote Indigenous communities on diesel electrical power (typically where grid transmission lines do not reach).
3. The reduction of greenhouse gas emissions from other net zero activities (e.g., solar power generation for mines to extract nickel or lithium for batteries for electric vehicles or solar panels/cells).

Nanticoke Solar Project

Spotlight on Indigenous Solar Projects

Hozho Homes Program

Project Profile:

- Hopi & Navajo
- New Mexico/Arizona, USA
- Individual Indigenous home ownership
- Variable megawatts
- Partners: Native Renewables
- Type: off-grid solar photovoltaic systems (powers individual homes)
- www.nativerenewables.org

Nanticoke Solar

Project Profile:

- Six Nations Development Corporation and Mississaugas of the Credit
- Ontario, Canada
- 15% Indigenous owned
- 44 megawatts
- Partners: Stantec; Ontario Power Generation
- Type: grid-tied (sells electricity to the Ontario grid)
- www.opg.com

Anticipated Opportunities in Solar Electrical Generation

The rapidly growing number of Indigenous-led, solar-based projects in the United States and Canada continue to create opportunities for Indigenous nations. What stands out about solar power generation, particularly in the Indigenous sphere, is the range of scale/size of projects. Our research for this paper unearthed many small solar projects in Indigenous communities in the United States and Canada that, for example, might power a school gym, band office, or individual homes on reserve/reservation. There is also a growing number of Indigenous-owned photovoltaic projects who sell power to the grid which generates revenues for the Indigenous nation or corporation, while offsetting other sources of power generation.

"The elders always say once you get to a certain age that's when you have to start working towards leaving a foundation for the next generation. This is a process that's been going on for thousands of years. We need to carry it on."

– Brandon Kyikavichik, *Vuntut Gwitchin*[126]

[126] Gignac, J., 5 May 2021. CBC News. "Vuntut Gwitchin First Nation's solar farm now generating electricity" https://www.cbc.ca/news/canada/north/yukon-vuntut-gwitchin-solar-farm-1.6015144.

Wind Power Generation

Wind power generation means creating electrical energy from the conversion of wind energy into rotating energy of the blades (wind turbines)[127] and converting that rotating energy into electrical energy through a generator.[128] Wind power generation does not produce any direct greenhouse gases. Like solar, wind power generation is growing globally at unprecedented rates: the International Energy Agency estimates that both wind and solar will represent 90% of new power capacity in 2022 and will exceed the global power capacity of coal and natural gas by 2025.[129] Like solar, wind generation has a range of scales from small single-home wind turbines to massive land-based or offshore windfarms. (For example, Denmark's domestic consumption of wind-generated energy was 47% as of 2019, the highest in the world[130]). In Canada and the United States, the current growth of wind generation is rapid, aided in part by supportive policy, as well as a 55-66% drop in the prices of wind turbines.[131] Finally, and perhaps an indication of a wind-driven electrical future, wind turbine service technicians are projected to be one of the fastest-growing jobs in the United States in the next ten years,[132] while in Canada, clean energy jobs are on track to grow, most notably in Alberta which is expected to see surge in wind power jobs at a 22% increase per year.[133]

Role of Wind Power Generation in Net Zero

Not only does wind increasingly play a central role in terms of employment and economic growth, but wind already plays an important role for the United States and Canada to meet net zero targets.

The reasons wind powered generation is important to net zero include:

1. Removing greenhouse gases from energy generation.
2. Reducing greenhouse gas emissions to enable other net zero activities (e.g., clean power generation for mines to extract nickel or lithium for batteries for electric vehicles or solar panels/cells).
3. Creating opportunities for Indigenous equity participation in wind projects at various scales (e.g., from a few wind turbines that replace remote diesel power generation, to large grid-tied wind farms facilities).

127 There are some kite technologies that also are being used to create power. Please see: https://www.bbc.com/news/av/uk-scotland-59190335.
128 https://www.toshiba-energy.com/en/renewable-energy/product/wind-power.htm.
129 IEA (International Energy Agency). 2021. "Renewable Energy Market Update 2021 - Outlook for 2021 and 2022." May. www.iea.org/reports/renewable-energy-market-update-2021.
130 Gronholt-Pedersen, J., 2 January 2020. Reuters. "Denmark sources record 47% of power from wind in 2019" https://www.reuters.com/article/us-climate-change-denmark-windpower-idUSKBN1Z10KE.
131 IRENA (International Renewable Energy Agency). 2020. "Costs." https://www.irena.org/costs.
132 USBLS (United States Bureau of Labor Statistics). 2019. "Fastest Growing Occupations." U.S. Bureau of Labor Statistics Occupational Handbook. April 9. https://www.bls.gov/ooh/fastest-growing.htm.
133 Clean Energy Canada, June 2021, "The New Reality" https://cleanenergycanada.org/wp-content/uploads/2021/06/Report_CEC_CleanJobs2021.pdf.

Spotlight on Indigenous Wind Power Generation Projects

Oceti Sakowin Power Project

Project Profile:

- 6 Sioux Tribes of South Dakota
- South Dakota, USA
- 100% Indigenous owned
- 60 gigawatts (=60,000 megawatts)
- Partners: Apex Clean Energy
- ospower.org/the-project/

Henvey Inlet First Nation Wind Energy Centre

Project Profile:

- Henvey Inlet First Nation
- Ontario, Canada
- 51% Indigenous owned
- 300 megawatts
- Partners: Pattern Canada
- henveyinletwind.com

Anticipated Opportunities in Wind Electricity

Our research points to a staggering growth in Indigenous-led wind projects in the United States and Canada. These projects range from small (under-1 megawatt) community wind turbines/ projects to large regional scale projects where Indigenous nations are selling power to the regional/ provincial/state power grid. This emission-free source of power helps the American and Canadian governments meet their net zero targets, but also fits with many Indigenous nations' values around renewable, non-greenhouse gas emitting sources of powering their communities and surrounding ones as well. As with nearly any infrastructural project on Indigenous lands, financing, supportive government policy, investment partners, and Indigenous membership support for projects are all crucial to making or breaking future opportunities for Indigenous wind power generation leadership and ownership.

Henvey Inlet First Nation Wind Energy Centre

Oceti Sakowin Power Project

Hydroelectric Power Generation

Hydroelectric power generation is a long-standing electric power source in many provinces, territories, and states throughout Canada and the United States, and was one of the first sources of energy used for electricity generation in these countries. Hydroelectric power is produced by harnessing moving water which flows through a pipe (penstock) and turns blades in a turbine to spin a generator and produce electricity. Typical hydroelectric facilities include run-of-river systems where the force of the current turns the turbine, and storage systems (dams) where water accumulates behind them and is released through as needed.[134]

Role of Hydroelectric Power Generation in Net Zero

Although hydroelectric power is a long-standing source of electric power, hydroelectric sources play, and will continue to play, a pivotal role in net zero for the United States and Canada. This important role includes:[135]

1. To date, hydroelectric production costs hold a strong advantage over other clean renewable energy sources.
2. Hydropower generally provides a more stable and reliable means of generating electricity than other clean renewable sources such as solar and wind power which depend on cloud cover/daylight hours and weather patterns respectively.
3. Indigenous nations, particularly in areas of Canada and the United States with adequate/abundant water to build hydroelectric facilities, are able to build or buy out existing facilities.
4. Electrifying key industry sectors that have traditionally relied on fossil fuels (such as electric mining trucks for mining rare earth minerals critical to making EV batteries).[136]

Seli'š Ksanka Qlispe' Dam

[134] U.S. Energy Administration Information. "Hydropower explained" https://www.eia.gov/energyexplained/hydropower/.
[135] McDaniel, P., 26 September 2017. Sciencing. "Alternative Forms of Energy in the Caribbean" https://sciencing.com/alternative-forms-of-energy-in-the-caribbean-13636565.html.
[136] BC Hydro. 31 January 2022. "A net-zero mine? Copper Mountain takes electrifying first step" https://www.bchydro.com/news/conservation/2022/mining-trolley-trucks.html?utm_source=connected&utm_medium=email&utm_campaign=22-02&utm_content=trucks.

Spotlight on Indigenous Hydroelectric Power Generation Projects

Seli'š Ksanka Qlispe' Dam

Project Profile:

- Confederated Salish & Kootenai Tribes
- Montana, USA
- 100% Indigenous owned
- 208 megawatts
- Partner: Energy Keepers Inc.
- energykeepersinc.com

Coral Rapids Power Corp.

Project Profile:

- Taykwa Tagamou Nation
- Ontario, Canada
- 100% Indigenous owned
- 28 megawatts
- Partner: Ontario Power Generation
- coralrapidspower.com

Anticipated Opportunities in Hydroelectricity

While there are abundant hydroelectric opportunities for Indigenous communities in the United States and Canada, it is important to note that Indigenous self-determination has historically, and continues to be, threatened by new hydropower infrastructure, for example the Site C dam in British Columbia and Muskrat Falls in Newfoundland and Labrador.[137] However, for Indigenous nations looking for emission-free energy infrastructure projects to power their communities and/or for equity ownership in projects, the hydroelectric industry in Canada is expected to receive $125 billion in funding and create 1 million Canadian jobs.[138] Many Indigenous nations in the United States and Canada are initiating hydroelectric infrastructure in their territories.[139]

[137] C. E. Hoicka, K. Savic, and A. Campney, (2021) Reconciliation through renewable energy? A survey of Indigenous communities, involvement, and peoples in Canada, Energy Research & Social Science, 74, https://doi.org/10.1016/j.erss.2020.101897.
[138] Hongoltz-Hetling, M., 5 February 2020. FP News. "Canada's Not-So-Green Green Energy" https://foreignpolicy.com/2020/02/05/canada-green-energy-hydropower-first-nations-environmental/.
[139] Indigenous Clean Energy, "Indigenous Clean Energy Projects", https://indigenouscleanenergy.com/.

Hydrogen

Hydrogen as an alternative energy source is receiving increased attention in identifying net zero solutions for various regions and jurisdictions. The two most common[140] types of hydrogen as an energy source are:

- **Green hydrogen:** Produced through an electrolysis reaction of renewable electric power with water.
- **Blue hydrogen:** Produced through fossil fuel natural gas and cleaned up using carbon capture and storage.[141]

Hydrogen, the element itself, is lightweight, easily storable, and energy-dense relative to other fuels. When burned, it produces no direct emissions of pollutants or greenhouse gases, making it an attractive net zero option.[142] While "blue hydrogen" is not emissions-free in the absence of carbon mitigation, "green hydrogen" can be emission free where the energy source powering the electrolysis for hydrogen is clean, such as via solar- or wind-powered.[143]

Fortescue Future Industries

[140] In addition to green and blue hydrogen, there is also brown hydrogen, yellow hydrogen, turquoise hydrogen and pink hydrogen, each are nicknames used by the energy industry to differentiate between the types of hydrogen. Source: https://www.nationalgrid.com/stories/energy-explained/hydrogen-colour-spectrum.

[141] FortisBC. August 2020. "Pathways for British Columbia to Achieve Its GHG Reduction Goals" https://www.cdn.fortisbc.com/libraries/docs/default-source/about-us-documents/guidehouse-report.pdf?sfvrsn=dbb70958_4.

[142] Graney, E. 6 November. The Globe and Mail (Canada). "Kenney advances hydrogen-energy push." advance.lexis.com/api/document?collection=news&id=urn:contentItem:6416-PHN1-JCRP-C4CV-00000-00&context=1516831.

[143] Morison, R., 22 November 2022. Bloomberg Green. "Giant Irish Offshore Wind Farm Planned In Ireland for Green Hydrogen" https://www.bloomberg.com/news/articles/2021-11-22/giant-offshore-wind-farm-planned-in-ireland-for-green-hydrogen?sref=52ZWO6YM.

Role of Hydrogen in Net Zero

Hydrogen has several unique advantages as a climate solution. Perhaps most importantly is its role as a solution to sectors that are most difficult to remove greenhouse gas emissions including trucking, shipping, and the production of steel, fertilizer, and cement.[144] The International Renewable Energy Agency predicts that the production and use of hydrogen is likely to create new centres of geopolitical influence, but emphasizes that "hydrogen is not a new oil. And the transition is not a fuel replacement but a shift to a new system with political, technical, environmental, and economic disruptions."[145] Clean Energy Canada points to four main ways in which hydrogen can play a role in net zero:[146]

1. Replacing fossil fuels with new hydrogen based applications.
2. Reducing the greenhouse gas emission from natural gas utilities (i.e., blending natural gas with up to 15% hydrogen to reduce emissions).
3. Replacing higher emitting hydrogen sources with low- or non-emitting ones (e.g., replacing blue hydrogen production with green hydrogen production).
4. Using hydrogen as storage to augment variable sources of energy (e.g., solar energy when the sun is not shining).

Spotlight on Indigenous Hydrogen Projects

Navajo Hydrogen Project

Project Profile:

- Navajo Nation
- Arizona, USA
- 100% Indigenous owned[147]
- 600 kg of hydrogen per day
- Partner(s): Big Navajo Energy; Navajo Nation Oil and Gas; H2Go; Governor's Office of Energy Development
- gvip.io/p/navajo-hydrogen-project

Fortescue Green Hydrogen Projects x3

Project Profile:

- Lheidli T'enneh; Homeguard Cree; Innu Nation
- British Columbia; Manitoba; Newfoundland Labrador - Canada
- In development, MOUs signed[148]
- Volume not determined
- Partner: Fortescue Future Industries
- https://fuelcellsworks.com/

[144] Clean Energy Canada. October 2020. "A New Hope: How hydrogen can deliver climate solutions and clean energy competitiveness for Canada" cleanenergycanada.org/wp-content/uploads/2020/10/CEC_Report_Hydrogen2020.pdf.
[145] International Renewable Energy Agency (IRENA). 15 January 2022. Press Release. "Hydrogen Economy Hints at New Global Power Dynamics Tweet". https://www.irena.org/newsroom/pressreleases/2022/Jan/Hydrogen-Economy-Hints-at New-Global-Power-Dynamics.
[146] Clean Energy Canada. October 2020. "A New Hope: How hydrogen can deliver climate solutions and clean energy competitiveness for Canada" cleanenergycanada.org/wp-content/uploads/2020/10/CEC_Report_Hydrogen2020.pdf
[147] Navajo Nation Oil and Gas Co. who is exploring this project is wholly owned by the Navajo Nation. Source: http://www.nnogc.com.
[148] Fuel Cells Works. 6 December 2021. "Fortescue Future Industries and Indigenous Leaders in Canada Collaborate on Green Hydrogen Projects." https://fuelcellsworks.com/news/fortescue-future-industries-and-indigenous-leaders-in-canada-collaborate-on-green-hydrogen-projects/.

Anticipated Opportunities in Hydrogen as a Fuel Source

There are three main areas in which green hydrogen is likely to present opportunities to Indigenous nations and otherwise. These include but are not limited to:[149]

1. **Raw materials:** supplying/creating hydrogen and the clean power to make it a clean fuel source rather than an emitting source.

2. **Storage and transportation:** exploring ways to transport hydrogen (which is currently high cost) through pipelines and/or clean transportation alternatives.

3. **Uses and applications:** use of hydrogen as a fuel such as in transportation (e.g., cars, trains).

Notably, Australian mining giant Fortescue Future Industries has signed agreements with three Indigenous nations in Canada for the purpose of exploring the viability of building green hydrogen projects.[150] According to the report *Road Map to a US Hydrogen Economy*, the United States is "already heavily engaged in the hydrogen economy with hundreds of millions of dollars of public and private investment per year …[with] more than 8,000 small scale fuel systems in 40 states, and more than 550 megawatts of large-scale fuel cell power installed or planned."[151] Available information on new, planned, or existing Indigenous-led opportunities in both the United States and Canada is thin.

> "We have scouted over 60 countries in the last 18 months, looking for where there are strong renewable resources and governments that are supportive of the green hydrogen industry. We think Canada is very attractive. It is resource-rich and there is strong government support for decarbonizing."
>
> -Julie Shuttleworth, *CEO Fortescue Future Industries*[152]

[149] CIC Energigune. "Hydrogen: Opportunities and Challenges of its Value Chain." https://cicenergigune.com/en/blog/hydrogen-opportunities-challenges-value-chain.
[150] Fife, R., 3 December 2021. The Globe and Mail. "Australian mining giant looks to Canada for green hydrogen projects" https://www.theglobeandmail.com/politics/article-australian-mining-giant-looks-to-canada-for-green-hydrogen-projects/.
[151] Fuel Cell & Hydrogen Energy Association. January 2021. "Road Map to a US Hydrogen Economy" https://www.fchea.org/us-hydrogen-study.
[152] Fife, R., 3 December 2021. The Globe and Mail. "Australian mining giant looks to Canada for green hydrogen projects" https://www.theglobeandmail.com/politics/article-australian-mining-giant-looks-to-canada-for-green-hydrogen-projects/.

Geothermal

Geothermal energy is a clean and renewable source that uses existing heat from the earth to generate power. Geothermal energy harnesses underground reservoirs where there are hot rocks saturated with water and/or steam. The hot water and/or steam is then piped up to a geothermal power plant, where it drives electric generators to create electricity or direct heating for applications like greenhouses, baths and spas, and buildings/homes.

Role of Geothermal Power Generation in Net Zero

In terms of clean electricity generation, geothermal requires relatively little land and water compared to other generation sources. By comparison, geothermal stations need only "47 acres per gigawatt produced, compared with 900 acres for coal, 1,400 acres for wind, and 4,300 acres for solar photovoltaic."[153] There remains a huge gap between the potential for generating electricity and heat from geothermal sources, which are renewable and mostly emission-free, and what has yet been built.[154] Canada and the United States would be well-served to invest further in this potential as a part of the transition to net zero.

Spotlight on Indigenous Geothermal Projects

Makushin Geothermal Project

Project Profile:

- Ounalashka Corporation
- Unalaska, USA
- Ounalashka Corporation, (51% ownership); Alaska Native Village Corporation formed pursuant to ANCSA and Chena Power, LLC (49%)
- 30 megawatts
- Partner(s): Chena Power; City of Unalaska
- alaskageothermal.info/

Tu Deh-Kah Geothermal

Project Profile:

- Fort Nelson First Nation
- British Columbia, Canada
- 100% Indigenous owned
- 7-15 megawatts
- Partner: Province of BC; Canada
- tudehkah.com/

Tu Deh-Kah Geothermal

[153] Cottrell, C., 26 October 2018. Native Business. "From Fear to Favor: Geothermal Energy's Future on the Reservation" https://www.nativebusinessmag.com/from-fear-to-favor-geothermal-energys-future-on-the-reservation/.

[154] Richter, A., 1 Apr 2021. Think GeoEnergy. "Researchers urge more support for geothermal in BC, Canada" https://www.thinkgeoenergy.com/researchers-urge-more-support-for-geothermal-in-bc-canada/.

Makushin Volcano: *Ounalashka Corporation*

Anticipated Opportunities in Geothermal Projects

Indigenous peoples of Canada and the United States are beginning to invest in geothermal power production as a contribution to reaching net zero by the 2050 greenhouse gas reduction targets and to advance economic self-determination. As of 2018, the United States Office of Indian Energy reported 6,000 megawatts of geothermal energy under development. Other than economic, financial, and geological barriers, geothermal projects in Indigenous contexts must respect the strong, multi-generational spiritual/traditional connections to geothermal resources that have contributed to hesitation with some geothermal development.[155]

To see what is possible when Indigenous peoples are equity owners in geothermal energy, one needs to look to the success of the Māori in Aotearoa New Zealand. The Māori have found a way to utilize geothermal resources while honouring their culturally relevant spiritual connection to geothermal resources in the earth by treating the resource as a living being, one that must be respected, not depleted.[156] The Māori are equity owners in commercial-scale geothermal power plants producing 287 megawatts of electricity, approximately 6% of Aotearoa New Zealand's total energy needs.[157] With decades of geothermal planning, financing, and operational experience, the Māori are now scaling up their geothermal operations and developing additional clean energy businesses. Geothermal projects led by Indigenous nations in the United States and Canada are likely to accelerate in the coming decade.

Please Watch

Video: The Emergence of Indigenous Geothermal Energy

Indigenous Sustainable Investment Series by the First Nations Major Project Coalition on Transitioning to Clean Energy:

https://www.youtube.com/watch?v=-6jI_zCkwjRI

[155] Cottrell, C., 26 October 2018. Native Business. "From Fear to Favor: Geothermal Energy's Future on the Reservation" https://www.nativebusinessmag.com/from-fear-to-favor-geothermal-energys-future-on-the-reservation/.
[156] Indigenous Sustainable Investment Series by the First Nations Major Project Coalition on Transitioning to Clean Energy : https://www.youtube.com/watch?v=6jI_zCkwjRI OR https://vimeo.com/670877142/5fe2f2d039.
[157] "Verdict Media Limited." Renewable Technology, https://www.renewable-technology.com/projects/geothermal-power-plant/.

Biomass

Biomass is renewable organic material that comes from plants or animals, such as wood, garbage, crops, landfill gas, and alcohol fuels. These materials are converted to energy through a variety of processes:[158]

- Direct combustion/burning of the biomass to produce heat;
- Thermochemical conversion (through pyrolysis and gasification) to produce solid, gaseous, and liquid fuels;
- Chemical conversion to produce liquid fuels; or
- Biological conversion to produce liquid and gaseous fuels.

The various biomass-derived fuels are typically used in industry, transportation, residential heating/electricity, electric power, and commercially. For perspective, in 2020, biomass provided about 5% of total primary energy use in the United States. In Canada, biomass is the third largest renewable source of electricity generation, contributing approximately 1.4% of Canada's electricity generation.[159]

Role of Biomass Power Generation in Net Zero

One major advantage of biomass use in the transition to net zero is avoiding the use of greenhouse gas-intensive fossil-fuel derived sources, since biomass burns or converts organic, renewable resources such as wood or waste rather than pulling new oil or gas out of the ground.[160] A second advantage of biomass is its potential to support wind and solar generation sources through providing an alternate source of energy when the sun is not shining and/or the wind is not blowing. However, biomass as a source of power or heat generation can only be positive for the climate and net zero targets if the biomass used comes from sustainably managed sources, as opposed to depleting forests and other organic sources of biomass.[161]

158 U.S. Energy Information Administration. "Biomass explained" https://www.eia.gov/energyexplained/biomass/.
159 Government of Canada – Natural Resources Canada. "Bioenergy" https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy/7295#bio.
160 U.S. Energy Information Administration. "Biomass explained" https://www.eia.gov/energyexplained/biomass/.
161 Drax. 22 December 2021. "Forests, net zero and the science behind biomass" https://www.drax.com/sustainable-bioenergy/forests-net-zero-and-the-science-behind-biomass/.

Spotlight on Indigenous Biomass Projects

Menominee Biomass Combined Heat & Power

Project Profile:

- Menominee Tribal Enterprises
- Wisconsin, USA
- 51% Indigenous owned
- 1,020,217 kilowatt-hours/year
- Partner(s): U.S. Department of Energy
- energy.gov/indianenergy/menominee-tribal-enterprises-menominee-tribal-enterprises-2014-project

Groupe ADL (wood pellet production)

Project Profile:

- Mashteuiatsh First Nation
- Québec, Canada
- 100% Indigenous owned
- Largest pellet producer in Québec
- Partner: Granules LG
- groupeadl.com/groupe_an.htm

Anticipated Opportunities in Biomass Projects

Many Indigenous nations throughout the United States and Canada may be well positioned to seize opportunities in biomass. Two commonly known biomass opportunities particularly relevant to Indigenous nations include:[162]

1. **Burning of wood or other bioenergy wastes and conversion to heat, electrical power, or combined heat and power.**

   Indigenous nations who have access to producing/manufacturing forest or other biomass (by-)products, and/or those who are reliant on fossil fuels for heat or electricity have advantages for biomass projects. Additionally, the local production of electricity and/or heat from biomass allows Indigenous nations to better insulate themselves from unstable fossil fuel prices while simultaneously advancing environmental goals by reducing dependence on greenhouse gas-emitting sources.[163]

2. **Production and/or use of wood or wood pellets for heating.**

   As stewards of their lands, including forests, Indigenous nations have considerable opportunities in the wood pellet sector. This includes equity ownership of wood pellet production plants, contracting, supplying, employment, operation, and procurement.[164]

   Given the commitment to 2030 and 2050 targets by the United States and Canada, and the fossil fuel alternative that sustainable, renewable biomass use and production represents, this area of economic opportunity within net zero has potential to continue to grow.

[162] U.S. Energy Information Administration. "Biomass explained" https://www.eia.gov/energyexplained/biomass/.
[163] U.S. Office of Indian Energy Policy and Programs. 21 April 2016. " New Biomass System Helps Menominee Indian Tribe of Wisconsin Reduce Its Carbon Footprint" https://www.energy.gov/indianenergy/articles/new-biomass-system-helps-menominee-indian-tribe-wisconsin-reduce-its-carbon.
[164] Canadian Biomass. 18 June 2020. "Canada's Indigenous communities: a key part of sustainable biomass energy" www.canadianbiomassmagazine.ca/canadas-indigenous-communities-a-key-part-of-sustainable-biomass-energy/.

Nuclear Power - Small Modular Reactors

Small modular reactors (SMRs) create power by using heat to make steam and turn a turbine. This power comes from a nuclear fission reaction.[165] SMRs are smaller than traditional nuclear power plants in terms of both physical size and in power output (less than 300 megawatts of electricity, as compared to 800+ megawatts in traditional nuclear power plants[166]).[167] "Modular" means that, unlike traditional nuclear power plants which are built on a site, SMRs are built in a factory, and are portable and scalable. "Reactors" refers to the nuclear fission reaction that occurs within these plants which is how they produce energy to make electricity. SMR uses can range from grid-scale units to provide reliable electricity, to smaller ones suitable for heavy industry and powering remote communities.[168]

Role of Nuclear Power Generation in Net Zero

According to the International Energy Agency, moving to a 100% clean electricity grid is the single most important climate action that countries can take.[169] In the face of climate change, nuclear power is being given renewed attention because it is greenhouse gas-emission free and a constant source of power (rather than variable such as wind or solar which depend on wind blowing/sun shining).[170] Additionally, nuclear power does not require rare earth minerals such as lithium or cobalt that wind and solar power installations do.[171]

However, like its larger nuclear power plant predecessors, SMRs also produce nuclear waste: for every 1,000-megawatts of nuclear power, there are approximately three cubic metres of radioactive waste produced per year, waste that takes 10,000 years to decay back to the radioactive levels of the original mined ore.[172] Containment of nuclear waste depends on the upkeep of infrastructure and stable political structure and resources for this upkeep over hundreds of years. Given this nuclear waste problem, coupled with the well-known nuclear disasters such as the 2011 Fukushima Daiichi tsunami catastrophe (Japan) and the 1986 nuclear plant meltdown in Chernobyl (Ukraine), there remains hesitancy around public acceptance of building new nuclear plans – SMRs or otherwise.[173] Further, nuclear power is costly and faces stiff competition from rapidly growing and cleaner sources like grid-scale renewable electricity storage.[174]

165 U.S. Office of Nuclear Energy. 28 May 2020. "4 Key Benefits of Advanced Small Modular Reactors" https://www.energy.gov/ne/articles/4-key-benefits-advanced-small-modular-reactors.
166 CBC News. 16 May 2021. "Three Indigenous-owned corporations show support for small modular reactors" www.cbc.ca/news/canada/saskatchewan/memorandum-of-understanding-nuclear-power-saskatchewan-1.6028892.
167 BBC News. 9 November 2021. "Rolls-Royce gets funding to develop mini nuclear reactors" https://www.bbc.com/news/business-59212983.
168 Canada's SMR Action Plan. "About the Action Plan" https://smractionplan.ca/.
169 International Energy Agency. "World Energy outlook 2021. www.iea.org/reports/world-energy-outlook-2021.
170 Clean Energy Canada. December 2021. "Underneath it all: Ensuring Canada's electricity grid can power our net-zero and economic ambitions is no small undertaking—and a big opportunity." https://cleanenergycanada.org/wp-content/uploads/2021/12/Clean-Electricity-Report-Layout-Web-1.pdf.
171 Kaufman, A.C., 1 December 2021. Canada's National Observer. "Is it time for a nuclear energy renaissance?" https://www.nationalobserver.com/2021/12/01/news/nuclear-energy-renaissance.
172 Ibid.
173 Ibid.
174 Clean Energy Canada. December 2021. "Underneath it all: Ensuring Canada's electricity grid can power our net-zero and economic ambitions is no small undertaking—and a big opportunity." https://cleanenergycanada.org/wp-content/uploads/2021/12/Clean-Electricity-Report-Layout-Web-1.pdf.

Whether or not Canada will scale up nuclear generation to meet net zero targets is still unknown. Canada's next generation of SMRs are not expected to be operational until around 2030.[175] In the US, the US$1.2-trillion infrastructure bill signed into law in late 2021 "provides aging, financially troubled nuclear plants a $6-billion lifeline to stay open and directs billions more for research into next-generation mini-reactors."[176]

Spotlight on Indigenous Nuclear Power Projects

Though some Indigenous nations are exploring the possibility of SMRs,[177] our research did not identify any Indigenous-owned nuclear power plants in the Unites States or Canada.

NuScale

Project Profile:

In the United States, NuScale Power is waiting on approval from regulators to build reactors in Idaho; NuScale states that it has engaged with "native American tribes, working to facilitate an open dialogue as the project has progressed," but no Indigenous equity ownership is cited.[178]

Des Nedhe Group, et. al.

Project Profile:

In Canada, three Indigenous-owned companies in Saskatchewan (Kitsaki Management, Athabasca Basin Development and Des Nedhe Group) have signed an MOU to explore SMRs. This potential project signals a baseline Indigenous ownership in SMR project exploration.[179]

Anticipated Opportunities in Nuclear Power Projects

SMRs are a fairly new technology and finding evidence of some potential emergent opportunities for Indigenous nations to date is slim. Given the minimal data on Indigenous-owned SMR development, whether this is emblematic of the level of Indigenous involvement can only be assumed. Finally, it is important to note that the mining of uranium for nuclear power has been devastating to some Indigenous communities – for example, between 1944 to 1986, the United States extracted millions of tons of uranium ore and then "abandoned more than 500 mines in Navajo territory, leaving behind radioactive dust and mine tailings that sent local cancer rates soaring."[180]

[175] Ibid.
[176] Kaufman, A.C., 1 December 2021. Canada's National Observer. "Is it time for a nuclear energy renaissance?" https://www.nationalobserver.com/2021/12/01/news/nuclear-energy-renaissance.
[177] CBC News. 16 May 2021. "Three Indigenous-owned corporations show support for small modular reactors" www.cbc.ca/news/canada/saskatchewan/memorandum-of-understanding-nuclear-power-saskatchewan-1.6028892.
[178] Nuscale. "Powering the Next Generation of Nuclear. https://www.nuscalepower.com/newsletter/nucleus-summer-2019/powering-the-next-generation-of-nuclear.
[179] CBC News. 16 May 2021. "Three Indigenous-owned corporations show support for small modular reactors" www.cbc.ca/news/canada/saskatchewan/memorandum-of-understanding-nuclear-power-saskatchewan-1.6028892.
[180] Kaufman, A.C., 1 December 2021. Canada's National Observer. "Is it time for a nuclear energy renaissance?" https://www.nationalobserver.com/2021/12/01/news/nuclear-energy-renaissance.

New/Expanded Transmission Lines

Once electricity is generated, it needs to be stored or distributed via transmission lines from the electricity production source to its end to users such as homes/businesses or neighbouring jurisdictions/communities. This process of moving electricity to end users is called transmission. Power travels from the power generation source to communities/end users through the power distribution grid, which is made up of transmission lines.[181] Like a road network where new roads are added to increase its reach, so too are power distribution grids expanded by adding new transmission lines. Building or expanding transmission lines and/or the power distribution grid requires substantial investment by proponents/builders of them.

Role of New/Expanded Transmission Lines in Net Zero

Electrical transmission is an essential step to reach net zero targets since it is how clean power can reach communities/jurisdictions still dependent on fossil-fuels.[182] Electrical transmission shared between/among adjacent jurisdictions (including Indigenous nations, states, provinces, territories and countries) is very important for those that still generate energy from fossil-fuel emitting sources: if these adjacent jurisdictions or even communities are able to purchase surplus and emission-free energy through a connected transmission grid, then overall greenhouse gases emissions are reduced. Further, electricity grids are central to enabling clean energy sources like wind and solar to be used, since these electricity sources provide supply that is variable (depending on the sun shining and wind blowing). In Canada and the United States, new grid infrastructure needs to be built out to fully make use of clean energy to meet net zero targets.[183]

Spotlight on Indigenous-owned New/Expanded Transmission Lines

Morongo Transmission LLC

Project Profile:

- Morongo Band of Mission Indians
- California, USA
- 50% Indigenous owned
- 220 kV line
- Partner: Southern California Edison
- morongonation.org

Wataynikaneyap Power LP

Project Profile:

- 24 First Nation Governments
- Ontario, Canada
- 51% Indigenous owned
- 230 kV line
- Partner: Fortis Inc.
- wataypower.ca

[181] Brain, M., "How Power Grids Work" www.science.smith.edu/~jcardell/Courses/EGR220/ElecPwr_HSW.html.
[182] United States Department of Energy. 17 November 2014. "Understanding the Grid" https://www.energy.gov/articles/infographic-understanding-grid.
[183] World Economic Forum. October 2021 "Getting to Net Zero: Increasing Clean Electrification by Empowering Demand" www3.weforum.org/docs/WEF_Increasing_Clean_Electrification_by_Empowering_Demand_2021.pdf.

Anticipated Opportunities in New/Expanded Transmission Lines Projects

In Indigenous settings, electrical transmission/grid opportunities typically arise where Indigenous nations can be equity partners in:

1. Indigenous equity ownership of existing, new, or expanding transmission lines that travel through and/or originate from Indigenous lands;
2. Exporting for sale and revenue generation clean electricity generated on Indigenous lands (such as an Indigenous owned solar farm) via transmission lines; and
3. Building new transmission lines for the purposes of connecting remote Indigenous communities who still rely on diesel or other fossil fuel sources for electrical generation.

However, it is important to note that Indigenous support for new and/or previously built (without Indigenous consent) transmission infrastructure is not ubiquitous. In opposition to the New England Clean Energy Connect corridor project, Lucien Wabanonik, elected councillor with Lac Simon's band council in Québec, illustratrates Indigenous disenchantment and weariness around new electrical transmission infrastructure:

"As I write this today, there are 33 hydroelectric plants, 130 dams and dykes, 2.6 million acres of reservoirs, tens of thousands of kilometers of transmission and distribution lines and roads illegitimately operating on our ancestral territories. Hydro-Québec doesn't rightfully own 36% of its total installed electrical capacity, yet we've never been compensated for this massive taking."[184]

[184] Bangor Daily News. 07 February 2021. "Hydro Québec has Left Québec's First Nations Behind" bangordailynews.com/2021/02/07/opinion/opinion-contributor/hydro-quebec-has-left-quebecs-first-nations-behind/.

Energy Efficiency

Energy efficiency is part of the net zero puzzle and includes any efforts or changes made to reduce the energy use/requirement by individuals and businesses. Improvements to energy efficiency are incredibly wide ranging depending on the context, building type, geography, and/or industry. Typical examples of energy efficiency work/efforts/changes include but are not limited to:

- Retrofitting buildings to recapture heat.
- Adding better insulation to buildings or homes.
- Converting to more efficient heating, such as heat pumps.
- Implementing new building code/standards for insulation, efficiency, and clean energy sources.
- Reducing greenhouse gas emissions from transportation.
- Reducing leakage (such as through infrared detection of methane gas pipe leakages).

Roles of Energy Efficiency in Net Zero

Once electricity has been distributed/transmitted to end-users such as homes, industrial manufacturing, commercial areas, or charging electric vehicles, one of the most salient topics in reaching net zero then becomes how *efficiently* that energy is used by these end-users. To demonstrate, if homes are poorly insulated or if factories are energy-intensive, then less clean energy can be distributed elsewhere, straining greenhouse gas-emitting power generation sources such as coal-fired power plants. However, if end-users of energy are as efficient as possible (e.g., well insulated buildings requiring less electricity to power them, or updated industrial technology that allows energy to be conserved), then clean electric power can be diverted to other end-users via transmission lines to reduce their fossil fuel energy sources.

"Massive improvements in efficiency are needed to achieve net-zero targets."

– Alyssa Fischer, *Former Energy Efficiency Policy Analyst*[185]

[185] Fischer, A., 29 March 2021. International Energy Agency. "How Energy Efficiency Will Power Net Zero Climate Goals" https://www.iea.org/commentaries/how-energy-efficiency-will-power-net-zero-climate-goals.

Spotlight on Indigenous-led Energy Efficiency Projects

Akiachak Energy Efficiency Project

Project Profile:

- Akiachak Native Community
- Alaska, USA
- Government funded
- Reduce energy costs in tribal buildings
- Partner: U.S. Office of Indian Energy Policy and Programs

Haílzaqv Strategic Fuel Switching

Project Profile:

- Haílzaqv (Heiltsuk) First Nation
- British Columbia, Canada
- Government funded[186]
- Replacing fuel furnaces with heat pumps
- Partner: Indigenous Off-Diesel Initiative
- heiltsukclimateaction.ca

Anticipated Opportunities in Energy Efficiency

Energy efficiency, or demand-side energy reduction, typically involves funding from government-backed programs which allow Indigenous communities to have energy audits or retrofits done on buildings and homes, or programs that provide training for Indigenous members to conduct these retrofits or audits. The opportunities within these efficiency programs are local employment, training opportunities, and benefit to Indigenous homeowners via upgrades (insulation, heat pumps, etc.).[187] While standalone energy efficiency projects generally do not constitute *major* project opportunities for Indigenous nations, when coupled with other clean energy generation projects, they add significant value. For example, if an Indigenous nation is using geothermal, solar or wind to generate electricity for the community, to offset diesel, and/or to sell that electricity to the power grid, more efficient Indigenous homes would translate to more power available to sell to the grid or to offset diesel-generated electricity.

[186] Funded by Clean BC, New Relationship Trust, Federation of Community Municipalities, Indigenous Off-Diesel Initiative, and BC Hydro.
[187] For example, BC Hydro's Indigenous Communities Conservation Program: www.bchydro.com/content/dam/BCHydro/customer-portal/documents/power-smart/residential/programs/indigenous-communities-conservation-program-info.pdf.

Transitioning away from hydrocarbons

"Our youth are going to inherit decisions we haven't even contemplated yet... They are one of our greatest resources in stemming global climate change."

– Chief Dana Tizya-Tramm, *Vuntut Gwitchin First Nation*

Carbon Capture, Utilization and Storage Technologies (CCUS)

Carbon capture, utilization and storage (CCUS) is any process that takes carbon dioxide emissions from sources, such as oil and gas projects or coal-fired power plants, and either reuses it or stores it so it will not enter the earth's atmosphere.[188] "Carbon" refers to carbon dioxide gas – the most abundant of the greenhouse gas emissions causing climate change. "Capture" refers to how these technologies do, or propose to, remove carbon dioxide from the atmosphere. "Utilization and Storage" refers to the two possible fates for captured carbon dioxide: either (1) the carbon is used, for example in the manufacture of fuels,[189] or (2) it is stored in underground geologic formations such as coal seams or deep saline reservoirs.[190]

Role of Carbon Capture, Utilization and Storage in Net Zero

One of the strongest arguments for carbon capture, utilization and storage in reaching net zero targets is for its use in industries that have no other options for reducing greenhouse gas emissions, most notably cement[191] and steel.[192] CCUS advocates argue that the technology can achieve 14% of the global greenhouse gas emissions reductions needed by 2050 and tend to consider it the main and practical way to achieve net zero in the industrial sector. While the estimated range varies between sources, CCUS has the potential to capture more than 90% of carbon dioxide emissions from carbon-emitting industrial facilities.[193]

However, CCUS as a standalone net zero solution attracts skepticism for three main reasons; (1) it is not yet economically feasible without substantial subsidization, (2) the CCUS technologies are not yet scalable to a degree that is meaningful for reducing carbon emissions from the atmosphere, and (3) oil, gas, coal, and other fossil fuel industries rely heavily on the possibility of CCUS technology rather than building clean energy alternatives that do not emit greenhouse gases.[194]

[188] United States Department of Energy. "Carbon Capture, Utilization & Storage" https://www.energy.gov/carbon-capture-utilization-storage.
[189] Center for Climate and Energy Solutions. "Carbon Capture". https://www.c2es.org/content/carbon-capture/
[190] United States Department of Energy. "Carbon Capture, Utilization & Storage" https://www.energy.gov/carbon-capture-utilization-storage.
[191] Making the cement is carbon-intensive because it uses fossil fuels to heat a mixture of limestone and clay to more than 1,400°C/2552°F. In addition, when limestone is heated with clays, an additional 600 kilograms/1323 pounds of carbon dioxide are released for every tonne of cement produced. While there are some alternatives to cement, they are in still in the early stages of development. Source: https://www.nature.com/articles/d41586-021-02612-5.
[192] Rabson, M., CTV News. 20 January 2022. "Hundreds of academics ask Freeland to scrap carbon capture tax credit" https://www.ctvnews.ca/climate-and-environment/hundreds-of-academics-ask-freeland-to-scrap-carbon-capture-ax-credit-1.5747401.
[193] Center for Climate and Energy Solutions. "Carbon Capture". https://www.c2es.org/content/carbon-capture/.
[194] Hoicka, C.E., 19 January 2022. Letter to Chrystia Freeland, Canadian Deputy Prime Minister & Minister of Finance. https://cehoicka.lab.yorku.ca/files/2022/01/Letter-from-Academics-re-CCUS-tax-investment-credit_January-2022-4.pdf?x98920.

Further, there were at least four Indigenous organizations who were among the signatories of an open letter to American and Canadian leaders that points to environmental injustice stating that:[195]

"...investing in carbon capture delays the needed transition away from fossil fuels and other combustible energy sources. It poses significant new environmental, health, and safety risks, particularly to Black, Brown, and Indigenous communities already overburdened by industrial pollution, dispossession, and the impacts of climate change."

Spotlight on Indigenous-owned Carbon Capture, Utilization and Storage Projects

No US-based Indigenous CCUS projects found

Frog Lake First Nation Power Plant
(includes CCUS technology)

Project Profile:

- Frog Lake First Nation
- Alberta, Canada
- 51% Indigenous owned
- 300 megawatts
- Partners: Kanata LP
- kanataclean.com/projects/

Joe Dion Chairman and Chief Executive Officer, *Frog Lake Energy Resources Corp*

[195] Center for International Environmental Law. 19 July 2021. "It's Time to End Carbon Capture of Climate Policy"https://www.ciel.org/issue/carbon-capture-and-storage/

Anticipated Opportunities in Carbon Capture, Utilization and Storage

"CCS technology has not reached the level of commercial maturity nor cost maturity that is likely going to be a solution before 2030."

– Canadian Natural Resources Minister Jonathan Wilkinson [196]

The future of Indigenous nations' involvement in CCUS in the United States and Canada remains unclear. For example, the Athabasca Chipewyan First Nation, Beaver Lake Cree Nation, and the Mikisew Cree First Nation (all adjacent to Canada's oil sands developments in Northern Alberta) have officially expressed concern to the Senate of Canada with using carbon dioxide removal to achieve Canada's net zero target, citing that the support of these technologies "will allow oil sands production to continue, and therefore, allow for the continued destruction of our lands and impacts to our people".[197]

However, Indigenous nations in both the United States and Canada located in areas with favorable geology (such as coal seems, deep reservoirs, or with rocks favorable for carbon mineralization[198]) may have a competitive advantage for new or expanding CCUS projects. Further, where governments grant subsidies to CCUS proponents, Indigenous nations should be at minimum co-recipients of such subsidies and seek equity ownership of CCUS projects which occur on their territories. Similarly, Indigenous nations already invested in fossil fuel extraction, coal, steel, or cement stand to benefit from such government subsidies supporting potential future growth for CCUS. Finally, projects-in-development, led by the Frog Lake First Nation and Kehewin Cree Nation (Canada)[199], and by the Upper Nicola Band (Canada)[200] are hopeful examples to watch in terms of Indigenous leadership and project growth in CCUS.

196 Rabson, M., CTV News. 20 January 2022. "Hundreds of academics ask Freeland to scrap carbon capture tax credit" https://www.ctvnews.ca/climate-and-environment/hundreds-of-academics-ask-freeland-to-scrap-carbon-capture-tax-credit-1.5747401.
197 https://sencanada.ca/content/sen/committee/432/ENEV/Briefs/2021-06-07_Brief_ACFNBLCNMCFN_e.pdf.
198 Carbon 180. "Mineralization". static1.squarespace.com/static/5b9362d89d5abb8c51d474f8/t/617fec7ce6f30a1e96cae5a2/1635773863390/Carbon180+FactSheet+Mineralization.pdf.
199 Kanata. "Frog Lake Nation and Kanata Developing Canada's First Net Zero Power Plant Using Natural Gas" https://kanataclean.com/projects/.
200 Holliday, I., CTV News. 14 October 2021. "B.C. facility aims to make vehicle fuel from carbon pulled out of the atmosphere" https://bc.ctvnews.ca/b-c-facility-aims-to-make-vehicle-fuel-from-carbon-pulled-out-of-the-atmosphere-1.5624124.

Carbon Credits and Carbon Offsets

Carbon Credits

Carbon credits are measurable and verifiable projects which result in reductions or removal of greenhouse gases from the atmosphere. These reductions/removals can be gained through:

- *Avoiding* the release of greenhouse gas emissions (e.g., replacing a diesel-driven electricity with a solar or wind powered electricity);
- *Removing* greenhouse gases from the atmosphere (e.g., planting trees which sequester/capture carbon out of the atmosphere);
- *Capturing and destroying* greenhouse gases already in the atmosphere (e.g., removing methane from wastewater).[201]

A single certified carbon credit represents the "ownership of the equivalent of one metric ton of carbon dioxide that can be traded, sold or retired."[202] To avoid market manipulation, expert panels and third party agencies use rigorous standards to verify and certify carbon credits.[203] If a carbon-emitting company is operating within a jurisdiction with a cap-and-trade market (California and Québec only[204]) then the State/Provincial government allows the company a specified amount of carbon it can emit, otherwise known as its "cap". If the company emits less than its cap it can then "trade" the unused carbon credits. If the company emits more than its cap, it must purchase credits either from other companies emitting below their emissions cap or from organizations issuing carbon credits (such as an Indigenous nation whose protection of forests on Indigenous lands has been verified and registered as an issuer/seller of carbon credits).[205]

[201] South Pole. "Carbon Offsets Explained" https://www.southpole.com/carbon-offsets-explained#question3.
[202] National Indian Carbon Coalition. "Economic Opportunity for Tribal Nations" www.indiancarbon.org/the-carbon-credit-market/.
[203] South Pole. "Carbon Offsets Explained" https://www.southpole.com/carbon-offsets-explained#question3.
[204] Center for Climate and Energy Solutions. "Carbon Capture". https://www.c2es.org/content/carbon-capture/.
[205] National Indian Carbon Coalition. "Economic Opportunity for Tribal Nations" www.indiancarbon.org/the-carbon-credit-market/.

Carbon Offsets

Like carbon credits, carbon offsets also represent emissions reductions made in order to compensate for emissions created elsewhere. And like carbon credits, offsets are "measured in tonnes of carbon dioxide-equivalent, which represents either a one-tonne reduction of carbon dioxide or its equivalent in other greenhouse gases."[206] However, carbon offsets can typically be purchased in a wider and more varied range of circumstances and market opportunities than only cap-and-trade markets, such as:

- Private sector companies (e.g., a mining company paying offset their carbon emissions because of their own net zero commitment or policy by purchasing offsets).
- A private individual (e.g., voluntarily purchasing carbon offsets for a trip by airline).
- Governments meeting their own legislated internal net zero targets (e.g., British Columbia's Carbon Neutral Government program legislating that all provincial public sector organizations achieve carbon neutrality).[207]

Typically, carbon offsets create greenhouse gas reductions outside of the purchasing organization and outside of regulatory requirements such as cap-and-trade systems.[208]

Role of Carbon Credits and Offsets in Net Zero

The use of carbon credits and offsets in net zero does offer some benefits to the global challenge of achieving net zero, including:

- Providing Indigenous nations with opportunities for carbon credit/offset projects, revenues, and the protection of traditional lands, forests, habitats and ecosystems.[209]
- Providing avenues to emitters in industries where technologies to reduce emissions are not yet available (e.g., cement and steel).[210]
- Reducing global reliance on fossil fuels.[211]
- Providing a relatively cost-effective way for greenhouse gas emitters to reduce emissions.[212]

[206] Clean Energy Canada. 16 April 2021. "Media brief: What are carbon offsets and how can they be used?" https://cleanenergycanada.org/media-brief-carbon-offsets-what-are-they-and-how-can-they-be-used/.
[207] Carbon Neutral Government program requirements. Government of British Columbiahttps://www2.gov.bc.ca/gov/content/environment/climate-change/public-sector/carbon-neutral.
[208] National Indian Carbon Coalition. "Economic Opportunity for Tribal Nations" www.indiancarbon.org/the-carbon-credit-market/.
[209] Clean Energy Canada. 16 April 2021. "Media brief: What are carbon offsets and how can they be used?" https://cleanenergycanada.org/media-brief-carbon-offsets-what-are-they-and-how-can-they-be-used/.
[210] Ibid.
[211] South Pole. "Carbon Offsets Explained" https://www.southpole.com/carbon-offsets-explained#question3.
[212] Bushnell, J. B. The Economics of Carbon Offsets. The Design and Implementation of U.S. Climate Policy (2012).

However, according to Mark Carney (in his capacity as co-chair of the Global Financial Alliance for Net Zero), carbon credits and offsets should be a "last resort": reducing the absolute emissions (i.e., not producing them in the first place) is far more important in terms of mitigating climate change.[213] Additional challenges to using carbon credits and offsets in net zero include:

- The potential disincentive for emitters to reduce their emissions by allowing them to buy credits rather than finding less emission-intensive operations.
- Making sure that offsets/credits are actually generated from real actions that would not have happened anyway[214] (e.g., an offset/credit is mistakenly granted to an organization for not cutting down a forest – but they were not going to cut it down anyways, thus resulting in no actual change to absolute greenhouse gas emission/sequestration).

Spotlight on Indigenous-owned Carbon Credits and Offsets Projects

Ahtna, Inc. Carbon Offset Project

Project Profile:

- Largest project developed for the US compliance offset market.[215]
- Ahtna/Alaska Native
- Alaska, USA
- 100% Indigenous owned
- 14,861,093 offsets issues; 506,729 acres;
- Partners: Finite Carbon
- www.ahtna.com/kanas
- **Mechanism for Carbon Credits:** State of California Air Resources Board

Great Bear Carbon Credit Corporation

Project Profile:

- Gitga'at Nation, Heiltsuk Nation, Kitasoo Band Council, Metlakatla First Nation, Nuxalk Nation, Old Massett Village Council, Skidegate Band Council, Wuikinuxv Nation, and the Council of the Haida Nation
- British Columbia, Canada
- 100% Indigenous owned
- 6 million hectares
- Partners: n/a
- greatbearcorp.ca/
- **Mechanism for Carbon Credits:** British Columbia Atmospheric Benefit Sharing Agreements

Finite Carbon Inc. and Ahtna Inc. *Carbon Offset Project, Alaska*

[213] Treloar, S. and Taraldsen, L. E., 23 November 2021. "Carney Says Carbon Offsets Must Be Limited to Residual Emissions." https://www.bloomberg.com/news/articles/2021-11-23/carney-says-carbon-offsets-must-be-limited-to-residual-emissions?sref=52ZWO6YM.

[214] Clean Energy Canada. 16 April 2021. "Media brief: What are carbon offsets and how can they be used?" https://cleanenergycanada.org/media-brief-carbon-offsets-what-are-they-and-how-can-they-be-used/.

[215] Finite Carbon. "Tribes, Alaska Native Corporations, and First Nations" www.finitecarbon.com/clients/tribes/.

Anticipated Opportunities in Carbon Credits and Offsets

The emergence of carbon markets in the United States and Canada has created a unique opportunity for Indigenous nations to develop carbon credit and offset projects both within cap-and-trade jurisdictions and elsewhere.[216] The vast majority of Indigenous-owned carbon credit and offset projects in Canada and the United States are forestry-based, and thus have the potential to align well with Indigenous values and rights and responsibilities regarding sustainable forest governance. For example, the revenues generated by the sale of carbon credits has enabled Indigenous nations in the United States and Canada to buy back ancestral lands and protect their lands and waters.

According to the US-based *National Indian Carbon Coalition*, while Indigenous-owned carbon credit/offset projects are typically based on Indigenous-owned forested lands, there are other ways Indigenous nations can benefit from them such as "switching to renewable fuels or emission reduction through improved efficiency of fleet vehicles."[217] Indigenous nations in the United States and Canada seeking opportunities in carbon credits/offsets may consider exploring opportunities such as the State of California Air Resources Board,[218] British Columbia Atmospheric Benefit Sharing Agreements,[219] the Québec Cap-and-Trade System for Emission Allowances,[220] and/or private sector carbon offset programs.

[216] Dohan, R., and Voora, V. November 2010. "First Nations Carbon Collaborative—Indigenous Peoples and Carbon Markets: An annotated bibliography" https://www.iisd.org/system/files/publications/fncc_bibliography.pdf.
[217] National Indian Carbon Coalition. "Economic Opportunity for Tribal Nations" www.indiancarbon.org/the-carbon-credit-market/.
[218] Government of California, "The California Air Resources Board". https://ww2.arb.ca.gov/.
[219] Province of British Columbia. "Atmospheric Benefit Sharing Agreements" https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/atmospheric-benefit-sharing-agreements.
[220] Province of Québec. "A Brief Look at the Québec Cap-and-Trade-System for Emission Allowances" https://www.environnement.gouv.qc.ca/changements/carbone/documents-spede/in-brief.pdf.

Part 4:

ESG Investment Standards and Net Zero

The Price Tag on Net Zero

Achieving net zero by 2050 will require massive capital investment in a variety of projects and sectors. According to the International Energy Agency, to reach net zero targets, the world will require clean energy investments of approximately $4-5 trillion per year by 2030. This is more than three times current spending on clean energy investments.[221]

The World Bank reports that "the world will need to make significant investment in infrastructure over the next 15 years – around US$90 trillion by 2030."[222] These very near-term 2030 investments are crucial to achieving the transition to a global net zero energy system by 2050.[223]

[221] International Energy Agency. May 2021. "Net Zero by 2050: A Roadmap for the Global Energy Sector" https://www.iea.org/reports/net-zero-by-2050.
[222] United Nations. "Financing Climate Action." www.un.org/en/climatechange/raising-ambition/climate-finance.
[223] International Energy Agency. May 2021. "Net Zero by 2050: A Roadmap for the Global Energy Sector" https://www.iea.org/reports/net-zero-by-2050.

The Opportunity Presented by Net Zero

Massive net zero investments on the horizon

The shift to a net zero economy presents a tremendous economic opportunity for countries, companies, and Indigenous nations to attract investment to net zero projects in their respective jurisdictions.

The Global Commission on the Economy and Climate's report from 2018 found that "bold climate action could yield a direct economic gain of US$26 trillion through to 2030 compared with business-as-usual."[224] [225] To achieve net zero by 2050, renewables will have to generate 90% of global electricity – 70% of that from solar and wind generation.[226] This transition away from fossil fuels will require a massive investment to the tune of US$100+ trillion in clean energy investments over the next 30 years.[227]

Given the size of the investment, and the number of sectors that investment will affect, the opportunities and benefits will be, and already are, massive.

Sustainable finance

What is ESG/sustainable finance?

ESG, also known as sustainable finance, is an approach to investment based on the idea that a company's social, environmental, and governance actions have a measurable impact on their profitability. Social, environmental, and governance factors can include those which are not part of a company's traditional financial analysis but may substantially impact financial results.

E = Environment refers to a company's environmental impact such as resource depletion, climate change, waste and pollution, and water use.

S = Social includes factors related to the company's treatment of people, suppliers, employees, health and safety issues, local communities, and other social factors.

G = Governance covers the corporate policies and internal governance of a company such as board diversity, company leadership, executive pay, internal controls, shareholder rights, and political engagement.

[224] United Nations. "Financing Climate Action." www.un.org/en/climatechange/raising-ambition/climate-finance.
[225] Global Commission on the Economy and Climate – New Climate Economy. "Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times." https://newclimateeconomy.report/2018/wp-content/uploads/sites/6/2018/09/NCE_2018_FULL-REPORT.pdf.
[226] International Energy Agency. May 2021. "Net Zero by 2050: A Roadmap for the Global Energy Sector" https://www.iea.org/reports/net-zero-by-2050.
[227] Carlin, D., 2 June 2021. Forbes. "The $100 Trillion Investment Opportunity In The Climate Transformation" https://www.forbes.com/sites/davidcarlin/2021/06/02/the-ieas-net-zero-climate-pathway-is-a-100-trillion-investment-opportunity/?sh=4f67a14e5597.

ESG+I Sustainable Finance

Missing from this E-S-G acronym is I = Indigenous. At the 2021 First Nations Major Project Coalition's *Indigenous Sustainable Investment* conference[228], it was discussed in depth that meaningful Indigenous involvement in ESG investment standards is minimal.[229]

By not including Indigenous rights, current ESG investment standards do not include an important 'risk' factor that can cause a project to be delayed, or negatively impact returns, or cause the failure of a project.

A key outcome of FNMPC's 2021 *Indigenous Sustainable Investment* conference was to Indigenize ESG sustainable finance to ensure that Indigenous rights inform any new project, from its inception.[230] [231] The result would be a reduction of risk for the proponent and better environmental and economic outcomes for the Indigenous hosts.

Why does ESG matter in the transition to net zero?

Having a positive ESG rating is important to a company to attract ESG-focused investment to their projects. Without investors, companies with aspirations to build, say, clean energy infrastructure, will not be able to proceed.

However, companies that can demonstrate true ESG compliance – that is, accurately addressing all potential investment risks - will be better positioned to attract some of the reported US$130 trillion that will be seeking net zero investments[232] such as critical mineral supply chain projects, and energy infrastructure such as clean power generation and transmission lines.

[228] von der Porten, S. and Podlasly, M., "Roadmap to investing in Canada: Indigenous inclusion in ESG Indigenous Sustainable Investment Conference Summary Report." May 2021. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-.

[229] Podlasly, M., 17 March 2021. Business in Vancouver. "Indigenous input missing from Canada's ESG investment standards" https://biv.com/article/2021/03/indigenous-input-missing-canadas-esg-investment-standards.

[230] von der Porten, S. and Podlasly, M., "Roadmap to investing in Canada: Indigenous inclusion in ESG Indigenous Sustainable Investment Conference Summary Report." May 2021. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-.

[231] First Nations Major Projects Coalition. "Top Ten List for Roadmap for Investing in Canada: Indigenous Investment in ESG" https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/06/FNMPC_Top10_v3.pdf .

[232] Stein, J., 3 November 2021. Washington Post. "Financial firms announce $130 trillion in commitments for climate transition, but practical questions loom" www.washingtonpost.com/us-policy/2021/11/03/climate-glasgow-bloomberg-carney/.

How important is ESG in investing?

Driven in part by socially conscious investors and increasingly concern about climate change, the push for sustainable business practices has led to a recent dramatic increase in the adoption of ESG sustainable finance standards and measures for the performance of companies/corporations.

What quickly accelerated this global interest in ESG investment was the 2020 open letter from US-based BlackRock (the world's largest asset manager with US$7.81 trillion in assets under management) to chief executives indicating that their expectation is for investments to be 100% "ESG integrated" by the end of 2020.[233]

Since 2020, this widely seen and repeatedly cited commitment by BlackRock indicates how profoundly ESG is globally reshaping how corporations do business. Further, the adoption of ESG standards has effectively become a minimum entry requirement for most large companies and investment managers – reflecting a now widespread global consensus that a commitment to sustainable investment should not only be part of a company's practices but can directly improve its profitability and performance.[234]

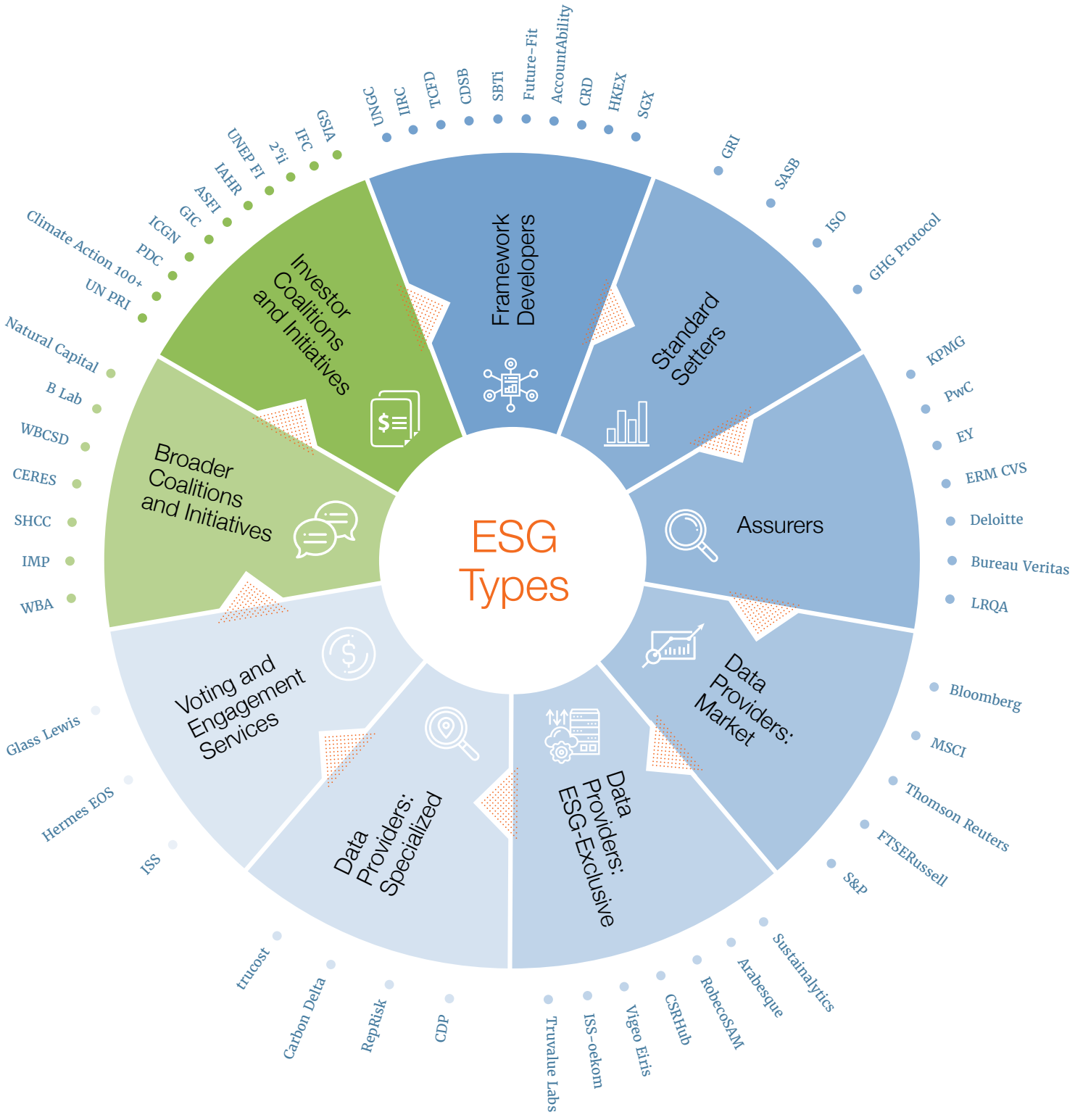
How many ESG standards are there?

ESG standards do NOT have a single set of global standards – there are hundreds of them, consisting of a patchwork of ESG standards created by companies, investors, and investment firms. However, several organizations and industry groups are working to build consolidated ESG standards.

[233] Fink, Larry. "BlackRock Client Letter: Sustainability." Sustainability as BlackRock's New Standard for Investing, BlackRock, www.blackrock.com/corporate/investor-relations/blackrock-client-letter.

[234] Indigenous Sustainable Investment: Discussing Opportunities in ESG (2021) Indigenous Sustainable Investment Conference Primer. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/04/FNMPC_ESG_Primer_2021_Final.pdf.

ESG Standards By Type



Infographic adapted from and source: World Economic Forum
https://widgets.weforum.org/esgecosystemmap/index.html#/

Today, the majority of institutional investors use one of the four major and mainstream consolidated ESG guideline frameworks:

GRI Global Reporting Initiative	GRI has the most widespread global adoption. Approximately 73% of the G250 and 67% of the N100[235] now use GRI."[236]
SASB Sustainability Accounting Standards Board	By 2020, 541 companies around the world were disclosing information to the public using SASB standards, with another 1273 companies mentioning or referencing select SASB metrics within their reporting.[237]
TCFD Financial Stability Board's Task Force on Climate-Related Disclosures	The TCFD's recommendations are supported by eight of the world's 10 largest asset managers. As of 2020, nearly 60% of the world's 100 largest public companies either support the TCFD, or report in line with the TCFD recommendations, or both.[238]
CDSB Climate Disclosure Standards Board	CDSB works with other initiatives who address reporting standards such as the Sustainability Accounting Standards Board (SASB) and the Global Reporting Initiative (GRI). CDSB works with 314 companies who use the CDSB Framework.[239]

[235] "The N100 refers to a worldwide sample of 4,900 companies comprising the top 100 companies by revenue in each of the 49 countries researched in this study." Source: Blasco, J. L., and King, A. KPMG. 2017. "The Road Ahead: KPMG Survey of Corporate Responsibility Reporting 2017" https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/10/executive-summary-the-kpmg-survey-of-corporate-responsibility-reporting-2017.pdf.

[236] Global Reporting Initiative (GRI). 01 December 2020. "Sustainability reporting is growing, with GRI the global common language" https://www.globalreporting.org/about-gri/news-center/2020-12-01-sustainability-reporting-is-growing-with-gri-the-global-common-language/.

[237] Sustainability Accounting Standards Board (SASB). "Global Use of SASB Standards" 18 Dec. 2020, www.sasb.org/global-use/.

[238] Task Force on Climate-Related Financial Disclosures. 2020. "2020 Status Report: Task Force on Climate-Related Financial Disclosures" assets.bbhub.io/company/sites/60/2020/09/2020-TCFD_Status-Report.pdf.

[239] Climate Disclosure Standards Board. "The Sustainability Accounting Standards Board (SASB)" https://www.cdsb.net/sustainability-accounting-standards-board-sasb

Consolidating ESG Standards

At the World Economic Forum's (WEF) annual Davos conference in 2020, the main focus was on ESG metrics – a focus that had been building over the previous five Davos conferences - but 2020 was the first time so many global CEOs were calling for a single set of metrics for all types of disclosures. The effort to develop a single metric or ESG standard was officially supported at Davos 2020 by 120 of the world's largest companies.[240] Since 2020, the International Sustainability Standards Board (ISSB) has been formed and is now working on further consolidation of global ESG standards - including climate-related disclosures.[241]

Officially launched in 2021, the ISSB is not the only global standard that companies will need to address. The GRI framework will likely continue to be the dominant standard in Europe, and remains the dominant standard in the world today.[242]

"We are currently heading towards having two major standards in the world for sustainability disclosures, one for Europe under EFRAG and one for North America (or possibly Global) under the IFRS with the ISSB. While this sounds confusing, this is as close as we've come in 30 years to consolidated and aligned disclosures and represents a major step in the development of global ESG disclosures."

– Michael Meehan, *Former CEO of GRI*

The World Economic Forum, business, and the reporting standards bodies themselves have pushed for the consolidation and alignment of the various global ESG standards for several years, and consolidation is now underway. Some standards are being rolled in with the newly formed ISSB, while other more established standards are working to align with these new frameworks to provide a more streamlined disclosure process.

[240] World Economic Forum. 22 September 2020. "Measuring Stakeholder Capitalism: Towards Common Metrics and Consistent Reporting of Sustainable Value Creation" https://www.weforum.org/reports/measuring-stakeholder-capitalism-towards-common-metrics-and-consistent-reporting-of-sustainable-value-creation.

[241] KPMG. 31 March 2022. "New Sustainability Standards Board". https://home.kpmg/xx/en/home/insights/2021/11/sustainability-reporting-climatechange-issb.html.

[242] Personal Communication. Michael Meehan. Former CEO of the Global Reporting Initiative (GRI) March 30, 2022.

What has happened in ESG and sustainable investment standards since the March 2021 FNMPC conference?

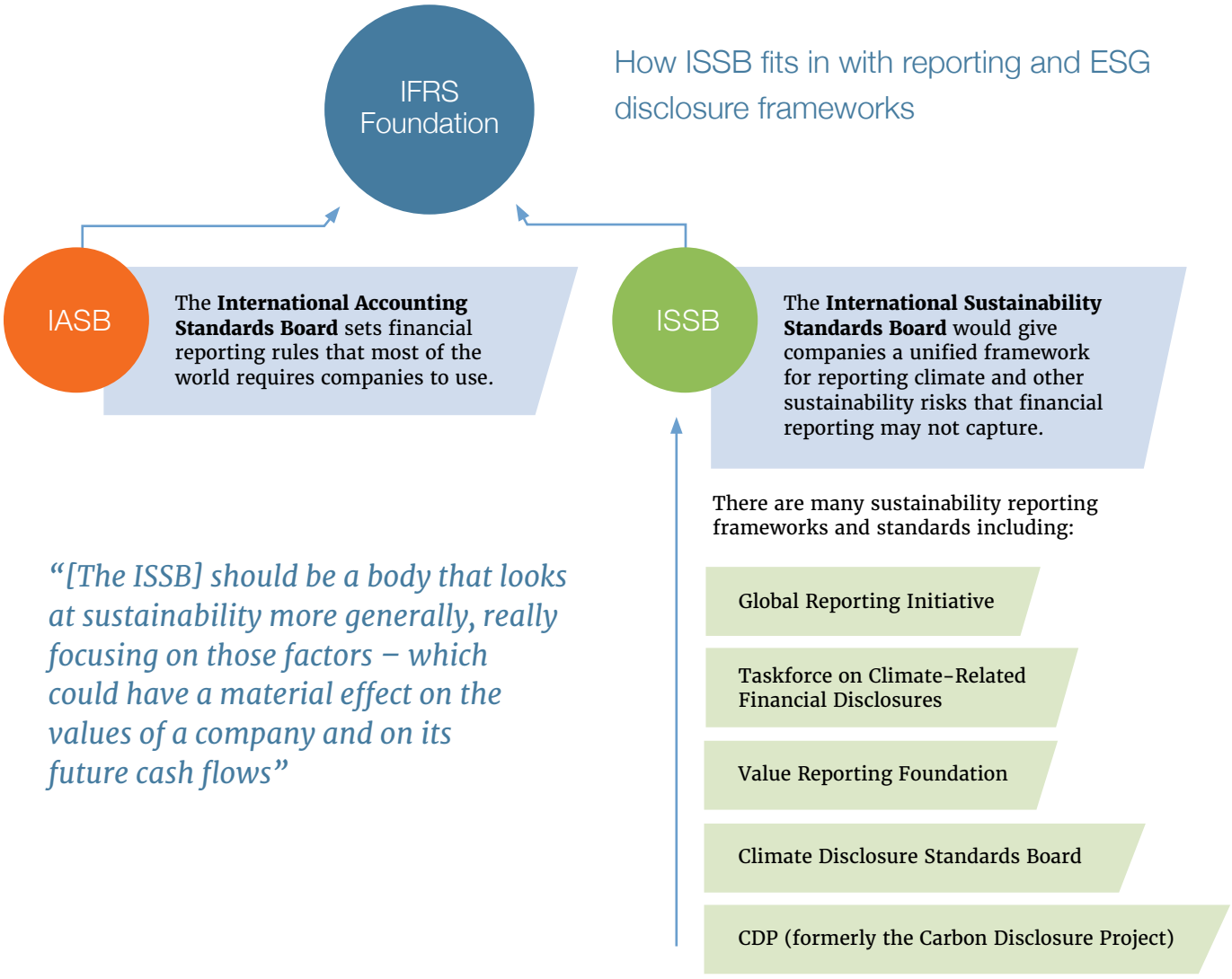
The sheer number of different ESG frameworks and standards has led to investor confusion around how to accurately evaluate investment risk. Multiple ESG frameworks, each with different evaluation criteria, results in inconsistent investment data.[243]

In November 2021, officials at the UN Climate Change Conference of the Parties (COP26) announced a process for the consolidation of several the key global ESG disclosure standards so that investors can make more informed decisions about ESG information around climate issues.

These consolidation measures include:

- A new International Sustainability Standards Board (ISSB)[244] will be formed to develop a comprehensive global baseline of high-quality sustainability disclosure standards to meet investors' information needs.
- The International Financial Reporting Standards (IFRS) Foundation will complete the consolidation of the Climate Disclosure Standards Board (CDSB) and the Value Reporting Foundation (VRF), which houses the Integrated Reporting Framework and the SASB Standards by June 2022.
- The publication of prototype climate and general disclosure requirements developed by the Technical Readiness Working Group[245] will undertake preparatory work for the ISSB.[246]

[243] S&P Global. 15 October 2021. "New global sustainability board aims to cut through disclosure confusion" www.spglobal.com/esg/insights/new-global-sustainability-board-aims-to-cut-through-disclosure-confusion.
[244] International Sustainability Standards Board. "About the International Sustainability Standards Board" https://www.ifrs.org/groups/international-sustainability-standards-board/.
[245] IFRS. 14 December 2021. "Technical Readiness Working Group: Recommendations for consideration by the ISSB" www.ifrs.org/news-and-events/news/2021/12/trwg-recommendations-for-consideration-by-the-issb/.
[246] IFRS. 03 November 2021. "IFRS Foundation announces International Sustainability Standards Board, consolidation with CDSB and VRF, and publication of prototype disclosure requirements." https://www.ifrs.org/news-and-events/news/2021/11/ifrs-foundation-announces-issb-consolidation-with-cdsb-vrf-publication-of-prototypes/.



"[The ISSB] should be a body that looks at sustainability more generally, really focusing on those factors – which could have a material effect on the values of a company and on its future cash flows"

Source: S&P Global Sustainable; S&P Global Market Intelligence
www.spglobal.com/esg/insights/new-global-sustainability-board-aims-to-cut-through-disclosure-confusion

The ISSB is expected to harmonize how businesses report on their ESG performance. The ISSB will coordinate its efforts with the International Accounting Standards Board, the International Monetary Fund, the Organisation for Economic Co-operation and Development, the United Nations Department of Economic and Social Affairs, and the World Bank.

"Sustainability, and particularly climate change, is the defining issue of our time. To properly assess related opportunities and risks, investors require high-quality, transparent, and globally comparable sustainability disclosures that are compatible with the financial statements. Establishing the ISSB and building on the innovation and expertise of the CDSB, the Value Reporting Foundation and others will provide the foundations to achieve this goal."

– Erkki Liikanen, *Chair of the IFRS Foundation Trustees*[247]

[247] Ibid.

To what extent are climate goals a part of ESG standards?

In many cases, climate goals are front-and-centre in ESG standards. The "E" (environment) in ESG standards typically incorporates corporate reporting on greenhouse gas emissions. In some cases, ESG reporting standards centre on reducing greenhouse gas emissions. For example:[248]

1. **CDP** – The Carbon Disclosure Project has its focus on **climate impacts** and corporate reporting on greenhouse gas emissions, water usage, and deforestation.

2. **CDSB** - The Climate Disclosure Standards Board also has its focus on **climate impacts** but uses the metrics of other standards like GRI.

3. **GRI** - The Global Reporting Initiative is the most widely used ESG reporting framework and includes **emissions standards** as well as effluent, waste, biodiversity, water, etc.[249]

4. **IIRC** – The International Integrated Reporting Council's ESG reporting framework includes factors such as water use as well as **greenhouse gas emissions**.[250]

5. **SASB** – The Sustainability Accounting Standards Board's ESG framework includes **greenhouse gas emissions** as well as air quality, water & wastewater management, and ecological impacts.[251]

[248] Niemoller, J., 8 June 2021. Perillon EHS Management Blog. "ESG Reporting Frameworks: Comparing CDP, GRI & More" https://www.perillon.com/blog/esg-reporting-frameworks.
[249] Global Reporting Initiative (GRI). "How to Use the GRI Standards". https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/.
[250] International Integrated Reporting Council (IIRC). January 2021. "International IR Framework". https://www.integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf.
[251] Climate Disclosure Standards Board. "The Sustainability Accounting Standards Board (SASB)" https://www.cdsb.net/sustainability-accounting-standards-board-sasb.

Are corporate "E" environmental ESG standards and net zero policies the same thing?

A company's ESG compliance plan and reporting, and its net zero or environment policy are not necessarily the same thing: a company may have an ESG compliance framework that it reports on or to, and/or it may also have a net zero or environmental plan that is not necessarily aligned with one of the ESG investment standards and frameworks.

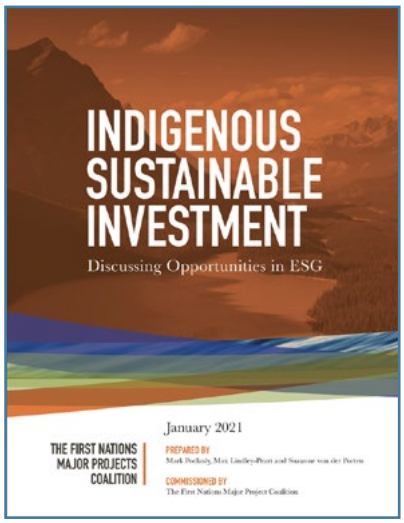
However, both a corporate ESG plan and an environmental or net zero plan contribute, in theory, to better environmental responsibility by the company.

For a more in-depth discussion of Indigenizing ESG Standards, please see the following First Nations Major Projects Coalition resources:

1. **Roadmap to Investing in Canada: Indigenous Inclusion in ESG** (2021) Indigenous Sustainable Investment Conference Summary Report. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/05/FNMPC_Conference_Overview_v6.pdf

2. **Indigenous Sustainable Investment: Discussing Opportunities in ESG** (2021) Indigenous Sustainable Investment Conference Primer. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/04/FNMPC_ESG_Primer_2021_Final.pdf

3. **Top 10 List: Roadmap for Investing in Canada Indigenous Investment in ESG** (2021) Summary Document. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/06/FNMPC_Top10_v3.pdf



Indigenous role in ESG

Do ESG frameworks include Indigenous priorities?

Despite how many there are, ESG frameworks do not, for the most part, include Indigenous priorities. As discussed in depth at the 2021 FNMPC *Indigenous Sustainable Investment* conference[252], meaningful Indigenous involvement in ESG investment standards is negligible.[253]

Not including Indigenous rights as a factor in determining a project's ESG rating means that an investor will not have a clear picture of the total investment risk that might be present due to environmental or economic opposition from Indigenous parties. The 2021 conference speakers discussed how in nearly every ESG framework, Indigenous issues are not considered to be material, or of importance, to ESG ratings.

Yet, one only must review news and social media to see what happens to projects that have not addressed adequately Indigenous rights. Given that it can take up to 15 years for a major project like a mine[254] or energy project to be put into operation, any delays due to unaddressed Indigenous rights could mean that a project will not be able to take advantage of market opportunities or be ready in time to meet 2030 net zero targets.

Risks of not including Indigenous nations in sustainable finance

"Businesses need to retain the consent of society – a social license – to be allowed to operate, to innovate, and to grow. When ESG factors are mismanaged, that social license can be suddenly withdrawn, damaging relationships with communities, customers, employees, and suppliers, destroying reputation and financial value, potentially terminally."

–Mark Carney, *Vice Chair, Brookfield Asset Management, Head of ESG and Impact Fund Investing and UN Special Envoy on Climate Action and Finance*[255]

[252] First Nations Major Project Coalition, Roadmap to Investing in Canada: Indigenous Inclusion in ESG, Indigenous Sustainable Investment Conference Summary Report, May 2021.
[253] Podlasly, M., 17 March 2021. Business in Vancouver. "Indigenous input missing from Canada's ESG investment standards" https://biv.com/article/2021/03/indigenous-input-missing-canadas-esg-investment-standards.
[254] Ontario Mining Association. "Mining 101" https://oma.on.ca/en/ontario-mining/Mining101.aspx.
[255] Top 10 List: Roadmap for Investing in Canada Indigenous Investment in ESG. 2021. Summary Document. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-content/uploads/2021/06/FNMPC_Top10_v3.pdf.

Without an Indigenous-informed interpretation of what qualifies as an ESG sustainable finance standard, any project or company that impacts Indigenous lands and rights will be hard-pressed to attract funds from institutional investors who are required to comply with global ESG criteria or even legal standards. Any such omission remains a massive and unaddressed capital risk, including commercial risks for companies that do not successfully engage Indigenous nations, leaders and communities.[256]

A continued failure to include Indigenous nations and their goals in ESG standards and net zero investments in Canada and the United States includes risks such as:[257] [258] [259]

- Infringements of Indigenous rights and probable rejection of net zero projects;
- Adverse effects on Indigenous interests, contributing to a non-favourable investment for new investments/projects on Indigenous lands;
- Legal risks, including potential protracted litigation;
- Reputational risk;
- Financial risk, including investment uncertainty;
- Project delays, intervention, disruptions, and cancellations; and/or
- Regulatory permitting delays.

While some investors sometimes apply their own lenses to assess a specific company's Indigenous engagement and relationships to see if there are investment risks, this is typically done in an ad hoc manner that is detached from ESG framework recommendations. The discussion remains of how to reduce this risk and improve investment sustainability and ESG compliance for all parties.

"...more effective climate-related disclosures that could promote more informed investment, credit, and insurance underwriting decisions and, in turn, enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks."

- Task Force on Climate-Related Financial Disclosures [260]

[256] von der Porten, S. and Podlasly, M., "Roadmap to investing in Canada: Indigenous inclusion in ESG Indigenous Sustainable Investment Conference Summary Report." May 2021. https://secureservercdn.net/45.40.145.201/14x.5f4.myftpupload.com/wp-.
[257] United Nations Global Compact. 2013. "A Business Reference Guide: United Nations Declaration on the Rights of Indigenous Peoples. United Nations Global Compact" d306pr3pise04h.cloudfront.net/docs/issues_doc%2Fhuman_rights%2FIndigenousPeoples%2FBusinessGuide.pdf.
[258] Davis, R., and Franks, D., 2011. "The Costs of Conflict with Local Communities in the Extractive Industry".
[259] Reconciliation and Responsible Investment Initiative. Advancing Reconciliation in Canada: A Guide for Investors. https://www.csrm.uq.edu.au/media/docs/145/Cost_of_Conflict_with_Local_Communities_in_Extractive_Industry_Davis_Franks_2011.pdf.
[260] Task Force on Climate-Related Financial Disclosures. 1 Oct. 2020. "The challenge we're addressing". www.fsb-tcfd.org/about/.

Solutions to Mitigating Financial Risk

Who in Canada and the United States are talking about including Indigenous rights in ESG standards?

In Canada, the Independent Review Committee on Standard Setting in Canada, coordinated by Chartered Professional Accountants Canada, has issued a consultation paper[261] that is to inform the creation of a Canadian sustainability standards board that would work alongside of Canada's existing accounting and assurance boards and liaise with the new ISSB. The consultation paper includes a specific section on referencing the rights of Indigenous peoples in the development of a sustainability standards board.[262] The Committee is consulting with key Indigenous nations for input to the proposed sustainability standards board.

In the United States, the Indigenous Women's Divestment Delegations, under the umbrella of WECAN International, is a platform where Indigenous women leaders meet face-to-face with representatives of financial institutions, insurance companies, and credit-rating agencies in Europe and the United States. The purpose of this work is to "expose injustices, and directly share with these entities - and the public, press, and government representatives - exactly how their fossil fuel investments violate human rights and Indigenous rights, while also driving climate disruption." This Indigenous Women's Divestment Delegations seeks to put pressure on financial institutions to "divest funds from fossil fuel extraction and infrastructure immediately, as well as to systematically change their policies regarding Indigenous and human rights and the climate crisis."[263]

Also in the United States, the Indigenous Economics Project is in development, described as a "comprehensive look at Indigenous economics, including market-based initiatives."[264] Associated with this, the news source *Indian Country Today* is involved in an Indigenous economics project funded by the Bay and Paul Foundations. The idea is to look at measuring and reporting about systemic economic issues that relate to "Indigenous health, community, climate and our future." A key component of that work is using ESG as a lens into the relationship between Indigenous people and the private sector.[265]

[261] Independent Review Committee on Standing Setting in Canada. 8 December 2021. "Consultation Paper". https://www.ircsscanada.ca/en/consultation-paper.
[262] Ibid.
[263] Women's Earth & Climate Action Network, International. "Indigenous Women's Divestment Delegations". https://www.wecaninternational.org/divestment-delegations.
[264] Yes! Magazine. "Mark Trahant". https://www.yesmagazine.org/authors/mark-trahant.
[265] Personal communication. Mark Trahant.

Indigenous nations and Indigenous-led organizations in both Canada and the United States have been exploring solutions to how to better include Indigenous rights in investment decisions. These include:

- First Nations Major Projects Coalition
- First Peoples Worldwide
- First Nation Financial Management Board
- Canadian Council for Aboriginal Business
- Reconciliation and Responsible Investment Initiative
- Shareholders Association for Research and Education
- National Aboriginal Trust Officers Association

Are Indigenous people in other countries discussing ESG sustainable finance?

"The benefits of integrating Indigenous values into ESG finance are clear, and I believe new ESG + Indigenous (ESGI) approaches represent a unique opportunity for Canada's First Nations to bring these models and frameworks to the international community for the benefit of all – not only to strengthen global institutional ESG investment but also to promote the inclusion and prioritization of Indigenous communities around the world."

– Michael Meehan, *Chairman, UK Sustainable Investment & Finance Association*[266]

The issue of how to make Indigenous people's rights 'material' or important is of concern in many countries.[267] While there are most likely more examples of Indigenous contributions to the issue of sustainable investing standards, Indigenous nations and organizations in other countries have already begun cutting edge work on incorporating Indigenous rights and priorities into sustainable finance. Two examples include First Peoples Worldwide and the Māori in Aotearoa New Zealand.

[266] Personal communication. March 16, 2022.
[267] Trahant, M., Indian Country Today. 18 January 2022. "Climate change, Indigenous community and ESG" https://indiancountrytoday.com/news/setting-a-climate-course-when-politics-divides.

First Peoples Worldwide Investment Resources
Indigenous Rights Risk Report

A notable Indigenous contribution to quantifying risk in investment is the *Indigenous Rights Risk Report*[268], produced by First Peoples Worldwide. The report addresses Indigenous rights as social risks to extractive industries: it analyzed the securities filings of 52 oil, gas, and mining companies listed and identified which of their projects overlap with or potentially impact Indigenous peoples.[269]

The *Indigenous Rights Risk Report* is a tool intended for use by the private sector to measure social risks (including Indigenous rights as a "risk") that tend to be underestimated in financial planning. This underestimation causes companies (and their shareholders) to be surprised or delayed by costly operational disruptions – or in some cases ceased altogether. The Risk Report also provides a framework for categorizing the circumstances in which violations of Indigenous peoples' rights jeopardize bottom lines – again for the purpose of supporting the private sector to anticipate and mitigate those circumstances to the fullest extent possible – effectively respecting and observing Indigenous legal and inherent rights.

Free, Prior and Informed Consent (FPIC) Due Diligence Questionnaire

First Peoples Worldwide developed another resource that contributes to the discussion of sustainable finance as it relates to Indigenous peoples: the *Free, Prior and Informed Consent (FPIC) Due Diligence Questionnaire*.[270]

The questionnaire provides a concise, Indigenous-informed list that investors, seeking to implement free, prior, and informed consent (FPIC) in the development of resources on and near Indigenous lands and territories in collaboration with Indigenous nations, must consider.[271] First Peoples Worldwide developed the questionnaire based on FPIC as described in Articles 10, 19, 29, and 32 of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) also reflecting all the Declaration rights, including the right to self-determination in Article 3.

The questionnaire also builds on the *UN Guiding Principles on Business and Human Rights*[272] assertion that businesses have responsibilities to respect the rights of Indigenous peoples during development. Ultimately, the questionnaire provides guidance for investors to perform adequate due diligence that improves mutually beneficial development opportunities with Indigenous nations and peoples.[273]

[268] First Peoples Worldwide. November 2014. "Indigenous Rights Risk Report" https://www.colorado.edu/program/fpw/sites/default/files/attached-files/indigenous_rights_risk_report.pdf.
[269] Ibid.
[270] First Peoples Worldwide. "Free, Prior and Informed Consent Due Diligence Questionnaire." www.colorado.edu/program/fpw/sites/default/files/attached-files/fpic_due_diligence_questionnaire-2.pdf.
[271] Ibid.
[272] United Nations Human Rights. 2011. "Guiding Principles on Business and Human Rights." https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf.
[273] First Peoples Worldwide. "Free, Prior and Informed Consent Due Diligence Questionnaire." www.colorado.edu/program/fpw/sites/default/files/attached-files/fpic_due_diligence_questionnaire-2.pdf.

Aotearoa New Zealand

Rather than relying solely on existing international frameworks and the emerging ISSB framework to guide sustainability decisions in Aotearoa New Zealand, the country is developing a new reporting framework that supports ESG to be used by for-profit, not-for-profit, and the public sector to ensure that the nation's unique national intergenerational values are respected.

The framework will be informed by Indigenous Maori values drawing from insights of *He Ara Waiora*[274] which references a Māori perspective on wellbeing.[275]

The framework will be developed in two parts. The first will be a framework for Māori entities to externally report the intergenerational and interconnected impact of the various activities they undertake. The second will determine if any amendments or further guidance is needed by other Aotearoa New Zealand sectors.

The new framework will be developed with extensive consultation with Aotearoa New Zealand ESG sectoral leaders including the Toitū Tahua Centre for Sustainable Finance.[276]

Aotearoa New Zealand

[274] Government of New Zealand. 1 April 2022. "External Reporting Board Nga Pou o te kawa ora Framework for ESG Reporting" https://www.gets.govt.nz/XRB/ExternalTenderDetails.htm?id=25543843.
[275] The Treasury, Government of New Zealand. 28 October 2021. "He Ara Waiora" https://www.treasury.govt.nz/information-and-services/nz-economy/higher-living-standards/he-ara-waiora.
[276] Ibid.

Toward Net Zero by 2050 Conference

This four part conference primer outlines for attendees some of what experts will be discussing at the *Toward Net Zero by 2050* conference on April 25-26, 2022 in Vancouver, Canada. Co-hosted by the First Nations Major Project Coalition (Canada) and First Peoples Worldwide (United States), the conference will feature Indigenous leaders, clean energy experts, mining executives, regulators, and investors, who will meet to learn what will be required to achieve Canadian and American net zero targets.

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