

# JUST TRANSITION GUIDE

INDIGENOUS-LED PATHWAYS TOWARD EQUITABLE CLIMATE SOLUTIONS AND RESILIENCY IN THE CLIMATE CRISIS



**INDIGENOUS**  
CLIMATE ACTION

POWER TO THE PEOPLE



DAVID SUZUKI  
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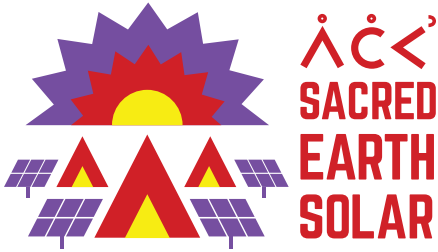
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# JUST TRANSITION GUIDE PARTNERS



## SACRED EARTH SOLAR

Sacred Earth Solar (SES) is an Indigenous women-led grassroots organization that works in solidarity with Indigenous communities by bringing climate solutions and healing initiatives directly to the frontlines of land protection, cultural resurgence, and language revitalization. At Sacred Earth Solar, we believe the time has come for communities to reintegrate the wisdom of our ancestors by implementing a just transition in Indigenous communities. We work towards a future where we are no longer reliant on fossil fuels, reduce our greenhouse gas emissions and inspire the world over to join us in our call to create a healthy planet that sustains all generations to come.



## INDIGENOUS CLIMATE ACTION

Indigenous Climate Action (ICA) is an Indigenous-led organization guided by a diverse group of Indigenous knowledge keepers, water protectors, and land defenders from communities and regions across the country. We believe that Indigenous Peoples' rights and knowledge systems are critical to developing meaningful solutions to the climate crisis and achieving true climate justice. ICA works on connecting and supporting Indigenous communities in the process of reasserting and reinforcing our place as stewards of lands and waters for the benefit of future generations. We model our work and organizational structure on systems of free, prior and informed consent and self-determination. By providing our communities with knowledge and resources, we inspire a new generation of Indigenous climate leaders to build solutions centered around our inherent rights and cultures.



## **POWER TO THE PEOPLE PRODUCED BY REALWORLD MEDIA**

Power to the People is a television documentary series hosted by Melina Laboucán-Massimo and produced by RealWorld Media. It explores the renewable energy revolution empowering Indigenous communities across Canada and around the world. The series covers numerous renewable energy or sustainable living projects, including food security, wind farms, solar power plants, run-of-the-river projects and tidal energy initiatives. Many of the communities profiled within the Just Transition Guide were interviewed during the filming of Power to the People.



## **DAVID SUZUKI FOUNDATION**

The David Suzuki Foundation (DSF) uses evidence-based research, public engagement, and policy advocacy to help communities from coast to coast to coast live with respect to nature's limitations, ensuring a sustainable future for all. We partner with Indigenous rights holders and diverse stakeholders to advance energy sovereignty and a Just Transition.

# OPENING LETTER FROM MELINA LABOUCAN-MASSIMO

In this Just Transition Guide, we're excited to share the stories of Indigenous communities leading the way on renewable energy, eco-housing, and food security, and we're grateful for the time they took to share with us. The climate solutions shared here support the revitalization of Indigenous cultures and languages. Indigenous knowledge creates community resilience in the face of climate change. This Guide is an offering and a resource for Indigenous Peoples and all who are looking for pathways towards implementing an equitable transition. It contains valuable success stories, real life examples, and important technical information, which together outline the ways communities can move forward through a Just Transition.

While our world transitions to renewable energy from fossil fuels, it is essential that we are critical and aware of the impacts of “clean” energy so we do not replicate the same system of harms that have been perpetuated from the previous energy era.

The contents of this Guide are summarized from my master's thesis, *Pîtâpan: Community Based Solar and Energy Sovereignty in the Tar Sands* at the University of Victoria. I continued this research during my fellowship at the David Suzuki Foundation while filming the TV docuseries “Power to the People” with Real World Media.

Indigenous voices from across Turtle Island are featured here, as are the stories of communities at the forefront of transition technologies who are leading the way to a just energy future. I am in awe of all the leaders I met across the country that we profiled and I am incredibly grateful for the experiences and relationships I built during this time.

With over 2000 Indigenous-led renewable energy projects in motion across so-called Canada, Indigenous Peoples are, without a doubt, leading the Just Transition.<sup>1</sup> Indigenous Clean Energy's 2023 most recent data has not been publicly released, however, Founding Executive Director Chris Henderson said in a 2023 Bloomberg article that Indigenous communities are the largest change agents in clean energy across the country as Indigenous communities are the largest asset owners of clean energy, outside of utilities.<sup>2</sup> We are in the midst of the transition, and Indigenous nations and communities are the ones leading it.

The Just Transition Guide was made possible by way of a partnership between Sacred Earth Solar (SES), Indigenous Climate Action (ICA) in collaboration with Power to the People and the David Suzuki Foundation. Of course, without the inspiring work of the communities involved, this Guide would not exist. This Guide is intended as a collective resource that ultimately makes it easier for communities to both share and build upon renewable energy knowledge. It is my hope that the Just Transition Guide will inspire and support the implementation of more climate solutions across Turtle Island in the years to come.

## MELINA LABOUCAN-MASSIMO

Lubicon Cree

Founder, Sacred Earth Solar | Co-Founder, Indigenous Climate Action  
Research Fellow, David Suzuki Foundation | Host, Power to the People

- 
1. Indigenous Clean Energy. Accelerating Transition: Economic Impacts of Indigenous Leadership in Catalyzing the Transition to a Clean Energy Future Across Canada. Pg. 7. June 2020, <https://indigenoucleanenergy.com/wp-content/uploads/2022/06/ICE-Accelerating-Transition-Data-Report-web.pdf>.
  2. Stephenson, Amanda. (March 20, 2023). Indigenous communities leading Canada's clean energy boom. BNN Bloomberg. <https://www.bnnbloomberg.ca/indigenous-communities-leading-canada-s-clean-energy-boom-1.1897860>



# ACKNOWLEDGMENTS

This resource was created by Sacred Earth Solar and Indigenous Climate Action, led by Melina Laboucan-Massimo.

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We are thankful for the stories and knowledge shared with us by the following people, communities, and organizations:

- Gull Bay First Nation
- Haida Communities of Old Masset and Skidegate
- Kanaka Bar Indian Band
- Kluane First Nation
- Lubicon Lake Band
- Mamalilikala First Nation
- Mi'gmaq Communities of Listuguj First Nation, Gespeg First Nation, and Gesgapegiag First Nation
- Namgis First Nation
- Nuxalk Nation
- shíshálh Nation
- Six Nations of the Grand River Development Corporation
- Snuneymuxw First Nation
- Squamish First Nation
- Taku River Tlingit Nation
- Teslin Tlingit Nation
- Tla-o-qui-aht Nation
- Tlowit'sis First Nation
- Tsleil Waututh Nation

We would also like to give thanks and honour the land defenders and water protectors on the frontlines of resistance, as well as other folks shaping Indigenous-led climate solutions. We hope this work can be of benefit to the fight for climate justice as well as to an Indigenous Just Transition.





# KEY LESSONS

The Just Transition Guide will take you on a journey into the lived experiences of Indigenous communities across Turtle Island who have faced centuries of colonial oppression, yet continue to act as leaders in the protection of Mother Earth. You will first learn about the energy and electricity sector of so-called Canada, followed by an overview of the types of renewable energy projects Indigenous Nations are taking on - including solar, wind, microhydro, geo-exchange, and small-scale biomass. Next, we'll dive deeper and look at initiatives focused on Indigenous food sovereignty, energy conservation, efficiency, eco-housing, and cultural revitalization. Finally, we'll explore and reimagine how energy policies in Canada have the potential to facilitate the Just Transition in Indigenous communities.

Based on our research and interviews with communities across Turtle Island, these are the top 10 lessons that Indigenous communities want to share about their Just Transition journeys. These topics will be explored in further depth throughout the Guide:

## **1. Colonialism, extractivism, and capitalism cause climate change and social injustice. Indigenous sovereignty, rights, and leadership create key solutions.**

Settler colonialism and capitalism are at the foundation of carbon-intensive economics and climate change - inherent to both is the erasure of Indigenous Peoples and the exploitation of our lands for profit.<sup>3</sup> Indigenous communities disproportionately face environmental racism,<sup>4</sup> energy poverty,<sup>5</sup> and the impacts of climate change.<sup>6</sup> Our Indigenous resurgence and cultural revitalization hinges on the reclamation, restoration, and regeneration of our relationships to land, community, and cultural practice.<sup>7</sup> In asserting our rights and our sovereignty, we are better equipped to lead the way to a just and sustainable future. We need to be critical of the concepts of net zero, nature based solutions and even a just transition to ensure that these concepts are not used for greenwashing the transition.

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3. Whyte, Kyle. (2017). Indigenous Climate Change Studies: Indigenizing Futures, Decolonizing the Anthropocene. English language notes, 55, 1(2), 153-62. <https://doi.org/10.1215/00138282-55.1-2.153>.
  4. Waldron, Ingrid R. G. (2018). There's Something in the Water: Environmental Racism in Indigenous and Black Communities. Manitoba: Fernwood Publishing.
  5. Heerema, Dylan, and Dave Lovekin. (2019). Power Shift in Remote Indigenous Communities - a Cross-Canada Scan of Diesel Reduction and Clean Energy Policies. Pembina Institute. <https://www.pembina.org/reports/power-shift-indigenous-communities.pdf>.
  6. Whyte, Kyle. (2017). Indigenous Climate Change Studies: Indigenizing Futures, Decolonizing the Anthropocene. English language notes, 55, 1(2), 153-62. <https://doi.org/10.1215/00138282-55.1-2.153>.
  7. Corntassel, Jeff, and Cheryl Bryce. (2012). Practicing Sustainable Self-Determination: Indigenous Approaches to Cultural Restoration and Revitalization. The Brown Journal of World Affairs, 18(2), 151-62.



## 2. The Just Transition offers a constructive path forward.

In order to ensure that new energy systems are part of a “Just” Transition, we must ensure that socially and economically marginalized communities are not further excluded by climate policies. Many communities are already seeing the benefits of a Just Transition - these include employment, revenue generation, capacity building, community pride, and a reliable energy supply.

However, while the term Just Transition continues to be debated and clarified, we must take into consideration the full scope of the impacts of transition technologies alongside benefits. Please refer to Ongoing Challenges with Renewable Energy, Greenwashing and Carbon Reductionism in section 1.4

## 3. Energy conservation and efficiency are an important first step. Understanding your community’s energy use and ways of reducing energy demand is key.

Energy conservation is the practice of using less energy, while energy efficiency is the practice of using technology to reduce energy demand.<sup>8</sup> These practices facilitate access to energy in a way that is more efficient, less wasteful, and less costly.<sup>9</sup> By reducing energy demand through both energy conservation and efficiency, you can reduce your community’s overall demand for electricity, which, in turn, enables you to select a renewable energy project properly scaled for your community. Section 2.3 discusses energy conservation and efficiency.

## 4. It’s worth becoming better acquainted with the key phases of renewable energy projects.

There are many phases to developing a renewable energy project - these include community visioning; project planning and design; financing; environmental and cultural impact assessments; interconnection applications; engineering and construction; operation and maintenance; and community capacity building. A solid understanding of these steps will better prepare you for your renewable energy journey! Using an example from Lubicon Cree First Nation, Section 3 further outlines the steps needed to create a solar project.

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8. U.S. Energy Information Administration. (2020). Use of energy explained: Energy efficiency and conservation. U.S. Energy Information Administration. <https://www.eia.gov/energyexplained/use-of-energy/efficiency-and-conservation.php>.

9. Natural Resources Canada. (2020). Energy Efficiency. Government of Canada. <https://www.nrcan.gc.ca/energy-efficiency/10832>.

## 5. Community engagement and relationships are vital.

Getting your community involved helps keep your project connected to your community's needs and values, while at the same time supporting energy education and capacity building. The transition away from fossil fuel use toward renewable energy can bring your entire community a sense of hope, pride, and agency. It's also important that relationships between Indigenous communities, utility companies, business partners, and other energy system stakeholders be built on a foundation of trust, respect, and understanding. We discuss the importance of these relationships in Section 6.

## 6. Capacity building leads to energy sovereignty.

By empowering our communities and developing the skill sets to own and maintain our own energy systems, we are able to supply reliable, clean energy to our people and become energy sovereign. Capacity building leads to employment, energy literacy, and increased community pride, while encouraging long-term energy self-sufficiency.

## 7. The Just Transition also encompasses our food systems, land, and homes.

The principles and strategies of the Just Transition extend beyond our energy systems - they also advocate for just relationships with one other and with the natural world. Section 5 will teach you about Indigenous food sovereignty, eco-housing solutions, and how communities have harnessed the power of clean energy projects to align with traditional teachings and encourage cultural revitalization.

## 8. Indigenous voices must be meaningfully included in energy policy decision-making.

Indigenous Peoples have been structurally excluded from the development of climate and energy policy. To achieve a Just Transition, our energy landscape needs radical, systemic change.

Solutions must be rooted in Indigenous self-determination, the full and meaningful inclusion of Indigenous Peoples, and the upholding of our rights, knowledge, sovereignty, and leadership.<sup>10</sup>

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10. Indigenous Climate Action. (2021). Decolonizing Climate Policy in Canada: Report from Phase One. Indigenous Climate Action. [https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf\\_critique\\_FINAL.pdf](https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf_critique_FINAL.pdf).



## 9. Energy policy must be equitable and reflect the lived realities faced by Indigenous communities.

Policy mechanisms can be used to create equitable access to a clean energy future, while also addressing the systemic inequalities that Indigenous communities face in so-called Canada. Funding can provide support for community capacity building, renewable energy projects, and the installation of more efficient technologies in diesel-reliant communities. Policy makers can ease this transition for Indigenous communities by facilitating the participation of Indigenous-led renewable energy projects in regulated energy and grid systems, while also supporting communities' elimination of fossil fuel subsidies. In these ways, policy has the potential to encourage further growth in the renewable energy sector, as well as highlight the harmful effects of extractivism and the fossil fuel industry on our communities. Policy support for Independent Power Producers (IPPs), long-term Power Purchase Agreements (PPAs), and equitable power purchase rates can all contribute to a Just Transition. Policy considerations for a Just Transition are discussed in Section 6.

## 10. Our communities are actively leading the way.

This Guide is the perfect example of our communities leading the way on the transition to renewable energy. We are creating a more sustainable energy future that aligns with our values as Indigenous Peoples, while also building community capacity and gaining energy sovereignty. In so-called Canada, there are nearly 200 medium to large renewable energy projects being led by Indigenous communities - with many more to come.<sup>11</sup>

**Note:** A comprehensive [glossary](#) and list of resources can be found in Section 8, at the end of this Guide.

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11. Indigenous Clean Energy. (2021). Indigenous Clean Energy Projects. Indigenous Clean Energy. <https://indigenouscleanenergy.com/connect-learn/indigenous-led-clean-energy-project-map/>.



## INTRODUCTION

Humanity is now at a crossroads and must choose between the destructive path of fossil fuel extraction and a transition back to sustainable ways of living in sacred balance with Mother Earth. Prior to colonization, Indigenous communities across Turtle Island were self-sufficient. What were once healthy, intact ecosystems offering clean air, water, medicines, berries and plants, have been replaced by toxic watersheds, contaminated air, and industrialized landscapes.<sup>12</sup>

The continued destruction of Indigenous homelands for fossil fuels is an example of “**neo-colonialism**,” the result of which is environmental and cultural genocide. **Settler colonialism** and capitalism are at the very foundation of carbon-intensive economics and climate change - and inherent to both is the erasure of Indigenous Peoples and the exploitation of our lands for profit.<sup>13</sup>

Throughout the duration of the Just Transition Guide you may see that the terms environmental justice and climate justice are used interchangeably in some instances. This is due to the fact that **environmental justice** and **climate justice** are interdependent processes. In many instances what are traditionally referred to as environmental injustices are also known drivers to the climate crisis, making it difficult to separate the two. When we advocate for environmental justice we are also advocating for climate justice and vice versa.

Many Indigenous and BIPOC communities today are facing environmental impact to unique ecosystems and displacement from their home territories eroding intimate stewardship practices. The brunt of the climate crisis is tied to the environmental degradation many Indigenous communities have been facing for decades through industry and fossil fuels development. Our communities would not have to be facing climate injustices if we were not already facing environmental injustice, and our guide uses these terms interchangeably due to their interconnection.

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12. Laboucan-Massimo, Melina. (2015). Pítâpan: Community Based Solar and Energy Sovereignty in the Tar Sands. [Unpublished Master's thesis]. University of Victoria.
13. Whyte, Kyle. (2017). Indigenous Climate Change Studies: Indigenizing Futures, Decolonizing the Anthropocene. English language notes, 55, 1(2), 153-62. <https://doi.org/10.1215/00138282-55.1-2.153>.

The exploitation of land in the name of “economic progress,” alongside racist government policies and strategies (such as the Indian Act, and the residential school system, among many other examples), have rendered Indigenous Peoples extremely dependent on external sources of food, fuel, and social services - even in the most isolated communities.<sup>14</sup> Rural, remote, and on-reserve Indigenous communities are much more likely to experience energy poverty - that is, a lack of affordable access to essential energy services that contribute to a good quality of life.<sup>15,16</sup> Indigenous communities also disproportionately face environmental racism,<sup>17</sup> the impacts of climate change,<sup>18</sup> and gendered violence - including increased violence towards Indigenous women, girls, and Two Spirit individuals in industrial extraction zones.<sup>19,20</sup> The entanglements of colonialism, **extractivism**, and capitalism have a long history of dispossessing, disempowering, and disenfranchising Indigenous Peoples, and still actively do so today.<sup>21</sup>

*“There has been nothing like disease that has been able to wipe us out. There has been nothing like colonialism that has been able to wipe us out. There has been nothing like poverty and hunger that has been able to wipe us out. One day Diyet, you just mark my words, the Indians of this world are gonna save it.”<sup>22</sup>*

These are the words of Diyet Van Lieshout's grandfather. Diyet, a singer, educator and community member of Kluane First Nation, is among those currently helping save the world by bringing back Indigenous teachings and ways of being.

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14. Heerema, Dylan, and Dave Lovekin. (2019). Power Shift in Remote Indigenous Communities - a Cross-Canada Scan of Diesel Reduction and Clean Energy Policies. Pembina Institute. <https://www.pembina.org/reports/power-shift-indigenous-communities.pdf>
  15. Ibid.
  16. Canadian Urban Sustainability Practitioners Network. (2019). Equity Implications of Energy Poverty in Canada. Canadian Urban Sustainability Practitioners Network. [https://energypoverty.ca/Equity\\_Energy\\_Poverty\\_EN\\_Nov19.pdf](https://energypoverty.ca/Equity_Energy_Poverty_EN_Nov19.pdf).
  17. Waldron, Ingrid R. G. (2018). There's Something in the Water: Environmental Racism in Indigenous and Black Communities. Manitoba: Fernwood Publishing.
  18. Whyte, Kyle. (2017). Indigenous Climate Change Studies: Indigenizing Futures, Decolonizing the Anthropocene. English language notes, 55, 1(2), 153-62. <https://doi.org/10.1215/00138282-55.1-2.153>.
  19. Amnesty International. (2016). Out of Sight, Out of Mind: Gender, Indigenous Rights, and Energy Development in Northeast British Columbia, Canada. Amnesty International. <https://www.amnesty.ca/sites/amnesty/files/Out%20of%20Sight%20Out%20of%20Mind%20EN%20FINAL%20web.pdf>.
  20. Gibson, G., K. Yung, L. Chisholm, H. Quinn, Lake Babine Nation, & Nak'azdli Whut'en. (2017). Indigenous Communities and Industrial Camps: Promoting Healthy Communities in Settings of Industrial Change. The Firelight Group.
  21. Simpson, Leanne Betasamosake. (2014). Land as Pedagogy: Nishnaabeg Intelligence and Rebellious Transformation. Decolonization: Indigeneity, Education & Society, 3(3), 1-25.

Haida Elder, Kii'iljuus Barbara Wilson, also speaks to the responsibility she feels to the land and to future generations:

But in the face of so many obstacles, how do we empower our communities, support future generations, and reconnect to our lands and waters? A **“Just Transition”** draws on traditional knowledge to reduce greenhouse gas emissions and ensure **energy sovereignty**.<sup>24</sup> The concept of a Just Transition originated

*“I want my people to go on living for thousands of years and to experience the world that I’ve been so privileged to live in. [...] We have a responsibility to look after all that we call our home.”<sup>23</sup>*

with the trade union movement's goal of protecting workers' rights while providing a way to switch industries amid economies transitioning to more sustainable practices - while also addressing climate change.<sup>25</sup>

In order for Indigenous Peoples to recover from the ongoing impacts of settler colonialism, we must transition to **renewable energy, locally grown and foraged foods, land stewardship, and the traditional teachings** which keep us living in balance with Mother Earth. Our Indigenous resurgence and cultural revitalization remain tethered to reclaiming, restoring, and regenerating our relationships to the land, communities, and cultural practices.<sup>26</sup> Only when we can protect the land, animals, and people, can we reclaim our sovereignty, self-determination, and wellbeing - ensuring our ability to plan for the next seven generations as our ancestors did.

If true reconciliation is to occur, the systems of harm that took hold during the fossil fuel regime cannot be allowed to replicate as we enter a renewable energy future.

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22. RealWorld Media. (2020). Power to the People. Episode 3: Kluane. APTN. <https://www.apntv.ca/power-to-the-people/video/season-1/>.
  23. RealWorld Media. (2020). Power to the People. Episode 7: Haida Gwaii. APTN, <https://www.apntv.ca/power-to-the-people/video/season-1/>.
  24. Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. Renewable & Sustainable Energy Reviews, 39,748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.
  25. Indigenous Environmental Network. (n.d.). Introduction to Just Transition. Indigenous Environmental Network. <https://www.ienearth.org/justtransition/>.
  26. Corntassel, Jeff, and Cheryl Bryce. (2012). Practicing Sustainable Self-Determination: Indigenous Approaches to Cultural Restoration and Revitalization. The Brown Journal of World Affairs, 18(2), 151-62.



# 1.1

## THE AGE OF CONSEQUENCE

Winters have become shorter and warmer. Glaciers are shrinking, permafrost is melting, and sea levels continue to rise. Every summer, we set new record-high temperatures. Rain is more erratic, both severe flooding and droughts are more frequent, and wildfires threaten more and more communities. Our ecosystems are under more and more stress from extreme weather events.<sup>27</sup> The planet is now warming at a catastrophic rate which has real potential to expand the areas inhospitable to life. This is otherwise known as climate change.

This life-threatening predicament is the result of capitalism, colonial exploitation, fossil fuel extraction, and the overall depletion of our natural systems.<sup>28</sup> Although Indigenous Peoples may not have used the term “climate change” traditionally, we were among the first to sound the alarm.<sup>29</sup> The scientific community seems to be always catching up. Indigenous people are long term residents of Turtle Island who hold deep, intergenerational ties to the land and knowledge of natural systems. We have survived climate fluctuations in spite of being the most severely impacted by climate change, and we are leaders in observing, understanding, and adapting to the climate crisis.<sup>30</sup>

Check out the work of the [Indigenous Climate Change Observation Network](#)<sup>31</sup> for more climate change observations by Indigenous communities.

## COMMUNITIES: WISDOM AND LIVED EXPERIENCE

The following stories share the firsthand experiences of Indigenous communities who have witnessed and responded to our changing natural systems. Throughout this Guide, we will be drawing on the diverse knowledge of our Indigenous communities with stories collected from *Power to the People, Pîâpan: Community Based Solar and Energy Sovereignty in the Tar Sands*, renewable project implementation by Sacred Earth Solar, as well as subsequent interviews with communities conducted by Indigenous Climate Action. It is our hope that these stories help emphasize the diversity of knowledge within our communities while also utilizing our wisdom as guiding principles.

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27. Bush, Elizabeth, and Donald S. Lemmen. (2019). Canada’s Changing Climate Report. Government of Canada. [https://changingclimate.ca/site/assets/uploads/sites/2/2020/06/CCCR\\_FULLREPORT-EN-FINAL.pdf](https://changingclimate.ca/site/assets/uploads/sites/2/2020/06/CCCR_FULLREPORT-EN-FINAL.pdf).

28. Deranger, Eriel., J. Gobby., & R Sinclair. (2021).. Decolonizing Climate Policy in Canada. Indigenous Climate Action. [https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf\\_critique\\_FINAL.pdf](https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf_critique_FINAL.pdf).

29. Turner, Nancy J., and H. Clifton. (2009). “It’s So Different Today”: Climate Change and Indigenous Lifeways in British Columbia, Canada. *Global environmental change*, 19(2), 180-90.

30. Ibid.

31. Climate Atlas of Canada. (2021). The Indigenous Climate Change Observation Network. Climate Atlas of Canada. <https://climateatlas.ca/focusing-climate-change#:~:text=The%20Indigenous%20Climate%20Change%20Observation%20Network,-Guided%20by%20the&text=The%20short-term%20objective%20of,their%20communities%27%20climate%20change%20resilience>.



*“The adverse effects of using the land and resources as we have been doing is now evident. We are experiencing drought, forest fires, heat, flooding, you name it - it’s happening. Kanaka Bar’s daily temp used to be about 33 C. It is hitting about 35 C. When I leave here and go to town, Lytton [located 18 km to the north] is now hitting 41 degrees C. This summer, twice, they’ve hit 49 C. We are living in the age of consequences, which is the result of 150 years of extractive, exploitive economies, and we are all collectively in the same boat. By becoming aware of the adverse effects of colonization, we can start getting ready for the economy and environment of tomorrow.”<sup>32</sup>*

**CHIEF PATRICK MICHELL**  
Kanaka Bar First Nation

## **KANAKA BAR FIRST NATION LIVING IN THE AGE OF CONSEQUENCES**

Kanaka Bar First Nation worked with **Urban Systems** to conduct a site-specific climate change impact assessment which examines weather and climate over the past forty years and makes projections for the future.

“A logical consequence of climate change,” says Chief Patrick, “is products and services that we take for granted as British Columbians and Canadians will become scarcer and, in scarcity, demand will exceed supply and the prices will increase.”<sup>33</sup>

A few years following this interview, Lytton and Kanaka Bar First Nation were subject to a massive forest fire that burned down many community members’ homes, including that of Chief Patrick.



32. RealWorld Media. (2020). Power to the People. Episode 9: Kanaka Bar. APTN.  
<https://www.aptnv.ca/power-to-the-people/video/season-1/>.

33. Ibid.



*Figure 1. Before (2018) and After (2021) images of the village of Lytton B.C. after wildfires (Source: Jenna Hauck/ Black Press Media)*

## MONTANA FIRST NATION ELDER'S WARNINGS

In a **Prairie Climate Centre case study**, Vickie Wetchie of Montana First Nation recalls the warning words from her Elders:

*“Mother Earth is talking and we need to listen. Climate change is here. I can feel it. I can sense it. I can see it. I think we can help. Changing the way we live. Changing the way that we’re not hurting Mother Earth. Indigenous communities can play a really big role in that.”<sup>34</sup>*

## TLA-O-QUI-AHT FIRST NATION STEWARDSHIP AND SELF-DETERMINATION

Tla-o-qui-aht First Nation is practicing self-determination and preparing for climate change by implementing a land use plan. They are monitoring the health of their forests, cleaning their rivers, restoring habitats, and cultivating stewardship among community members. Having protected their territory for this long, it's little surprise that they attract roughly 600,000 visitors to their shores every year.

“Tourism comes with an innocuous impact,” says Saya Masso, Lands and Resource manager for Tla-o-qui-aht First Nation, “but at a cost to our nation. Sewage outfall covers our eelgrass. The people that walk this beach trample sand fleas that feed the herring. We don't have herring anymore. We are really trying to get tourism to come to the table to have reconciliation.”<sup>35</sup>

34. Climate Atlas of Canada. (2018). Montana First Nation: Community Owned and Operated Solar Company. Youtube. <https://youtu.be/Q2g6MdOFFR8>.

35. RealWorld Media. (2020). Power to the People. Episode 10: Tla-o-qui-aht. APTN. <https://www.apntv.ca/power-to-the-people/video/season-1/>.





## 1.2

## THE FUTURE WE WANT

*“Renewable energy is one of those rare industries that Indigenous communities embrace willingly because it aligns with our values.”<sup>36</sup>*

**MATT JAMIESON**

Six Nations of the Grand River Development Corporation

*“From a traditional perspective, the health of our peoples cannot be separated from the health of our environment, the practice of our spirituality and the expression of our inherent right to self-determination, upon which the mental, physical and social health of our communities is based.”<sup>37</sup>*

**INTERNATIONAL INDIAN TREATY COUNCIL**

Our communities understand that building capacity to return to our traditional knowledge systems, foods, medicines, and ways of life provides a pathway to tackle the increasing health disparities and social inequalities faced by Indigenous people. The recognition that healthy lands promote a healthy life increasingly permeates non-Indigenous circles. The viability of our culture and life is inextricably linked to a healthy ecosystem. This understanding has been integral to our Indigenous knowledge systems since time immemorial.

The observed consequences and imminent risks of capitalist resource extraction and climate change are forcing countries around the world to address fossil fuel addiction and transform their socio-economic systems - including their energy sectors. So-called Canada is engaged in an energy transition, albeit slower than what the climate movement and clean energy sector has pushed for. Currently, the federal, provincial, and territorial governments are proposing inadequate climate plans that do not live up to international climate obligations - however, the country still has the opportunity to accelerate toward a clean energy future.<sup>38</sup>

Indigenous communities need to be (and in many cases already are) at the forefront of this energy transition to ensure that our future energy system does not reproduce the imbalances and inequities of the current one.

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36. RealWorld Media. (2020). Power to the People. Episode 4: Six Nations. APTN.

<https://www.apntv.ca/power-to-the-people/video/season-1/>.

37. Gemmell, Faith. (1996). Indigenous Women and Environmental Violence. International Indian Treaty Council's Oral Intervention at the 7th Session of the United Nations Permanent Forum on Indigenous Issues. <https://www.iitc.org/wp-content/uploads/2013/08/Indigenous-Women-and-Environment-PaperFINALEGMSUBMISSIONJan182012rev1.pdf>

38. Climate Action Tracker. (2021). Canada. Climate Action Tracker. <https://climateactiontracker.org/countries/canada/>.

## 1.3

# A “JUST” TRANSITION FROM FOSSIL FUELS TO RENEWABLE ENERGY

*“Indigenous prophecy meets scientific prediction. What we have known and believed, you also now know: the Earth is out of balance. The plants are disappearing, the animals are dying, and the very weather – rain, wind, fire itself – reacts against the actions of the human being. For the future of the children, for the health of our Mother Earth, Father Sky, and the rest of Creation, we call upon the people of the world to hold your leaders accountable.”<sup>39</sup>*

Circles of Wisdom: Native Peoples/Native Homelands Climate Change Workshop held in Albuquerque, New Mexico, November 1998

*“Our collective Just Transition journey must embody and embrace a decolonized energy reality. Empowering Indigenous peoples - Canada’s most powerful clean energy community - is central to social justice, protects the ecological integrity of ancestral lands, and accelerates the realization of a net zero climate future. Thereby, we will also create abundance.”*

**CHRIS HENDERSON**

Founding Executive Director, Indigenous Clean Energy



39. Indigenous Environmental Network. (n.d.). Introduction to Just Transition. Indigenous Environmental Network. <https://www.ienearth.org/justtransition/>.



## WHY IS A JUST TRANSITION IMPORTANT?

To achieve a Just Transition to new ways of harnessing energy, we must ensure that socially and economically marginalized communities are not further excluded by climate policies. As we move away from fossil fuels, the right energy policies can be used to achieve a Just Transition to renewable energy - one that supports workers and communities.

The “Just” in Just Transition generally refers to a social justice framework that considers, prioritizes, and ensures equitable outcomes for workers and communities in the implementation of policies to reduce greenhouse gas emissions. In this case, equity means a fair distribution of costs and benefits, which also takes into consideration communities who have been historically and structurally oppressed (i.e., women, LGBTQIA2S+, Indigenous Peoples, immigrants, and racialized communities).<sup>40</sup>

However, it’s about more than just renewable energy; the Just Transition movement is guided by knowledge-sharing and storytelling that is inherently uplifting to our communities. By building capacity, providing access to resources, and influencing systems in career development to move toward sustainable livelihoods for Indigenous peoples, a Just Transition is born.


An Indigenous-led Just Transition offers an expansive range of strategies and principles to “transition whole communities to build thriving economies that provide dignified, productive and ecologically sustainable livelihoods; democratic governance and ecological resilience.”<sup>41</sup> By way of example, the **Indigenous Environmental Network** created the “Indigenous Principles of a Just Transition,”<sup>42</sup> which focus on the importance of responsibility, relationships, sovereignty, and transformation for action.

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40. Mertins-Kirkwood, Hadrian, and Z. Deshpande. (2019). Who Is Included in a Just Transition? Considering Social Equity in Canada’s Shift to a Zero-Carbon Economy. Canadian Centre for Policy Alternatives and Adapting Canadian Work and Workplaces to Respond to Climate Change. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition\\_final.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition_final.pdf).

41. Ibid.

42. Indigenous Environmental Network. (n.d.). Indigenous Principles of a Just Transition. Indigenous Environmental Network. <https://www.ienearth.org/wp-content/uploads/2018/08/PrinciplesJustTransition-BW.pdf>



*“Just Transition is a new term, but to most of our Indigenous peoples, it is understood, first by our heart, and secondly by our mind. Just Transition is a framework, a set of principles, to shift from a “stopping the bad to building the new.” In Indigenous thought, it is a healing process of understanding historical trauma, internalized oppression, and de-colonization leading to planting the seed and feeding and nurturing the Good Way of thinking. It is lifting up Original Instructions and Teachings of respecting ourselves, our clans, our family systems and how we are all related with all living things and our relationship with the spirit, personality and consciousness of the sacredness of Mother Earth and Father Sky.”<sup>43</sup>*

These principles outline how we must transform our relationship with Mother Earth by taking greater responsibility for our interactions with our ecosystems, rejecting the commodification of nature, upholding Indigenous knowledge, and understanding that our lands, waters, and territories are at the core of our existence and survival.<sup>44</sup> The Just Transition will weave together Indigenous-based balanced economies, energy justice and democracy, clean energy and energy efficiency, community-based healthcare and healing centres, community-based planning, ecosystem restoration, and meaningful, localized employment.<sup>45</sup>

To read more about the principles of the Just Transition, check out the **Climate Justice Alliance** and the **Indigenous Environmental Network**.

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43. Indigenous Environmental Network. (n.d.). Introduction to Just Transition. Indigenous Environmental Network. <https://www.ienearth.org/justtransition/>.

44. Ibid.

45. Ibid.



## 1.4

# ONGOING CHALLENGES WITH RENEWABLE ENERGY, GREENWASHING AND CARBON REDUCTIONISM

*“You have to quit crying on the shoulder of the guy who stole your land.”*

**ARTHUR MANUEL**

(1951 - 2017)

Secwepemc Political Leader

Renewable energy systems (sometimes referred to as clean, green, and/or sustainable energy systems) can have a tremendously positive socio-economic impact on our communities, if and when they are initiated by our communities, for our communities. It's important to understand that renewable energy still requires extraction, and, in many cases, the destruction of Mother Earth for the production of required materials. The reality is, we need to stop trying to control nature and start working towards a reciprocal relationship with Mother Earth instead. In order for us to find this balance we need to move toward a Just Transition that embodies climate justice.

*“A climate justice framework does not reduce the climate crisis to a puzzle simply focused on counting carbon. ... As such, climate justice centers the place-based leadership of peoples with the longest-living knowledge of Earth's natural ecological systems, understanding that such Indigenous Traditional Knowledge and local ecological knowledge are core to envisioning a long-term strategy for engaging future shocks, slides, pandemics and upheavals headed our way.”<sup>46</sup>*

Environmental solutions not rooted in environmental justice and climate justice are not solutions. Many “green” energy projects are sold to our communities by outside groups and corporations as the solution to our problems. But often, these groups and corporations are simply out to profit from our lands and territories. In some cases, they even exploit our lands and territories to power urban centres, leaving our communities in an energy deficit and doing very little to alleviate the many socio-economic challenges worsened by their interference.

Outside experts and businesses do not always understand or have our best interests at heart and are often driven by profits rather than by a need to address the historical legacy of colonization, energy and economic poverty, or the increasing impacts of climate change.

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46. Hoodwinked in the Hothouse. (2021). “Resist False Solutions to Climate Change”. Third Edition. California.



In a world of self-proclaimed ‘experts,’ it’s important to absorb our teachings in humility: sometimes nature changes in such a way that it is necessary to pivot in our understanding of the natural world. As such, it is important to keep that relationship with nature intact and thriving.

We need to understand our communities, our knowledge, and our people as expert sources of information that are instrumental in determining what is best for our communities. Too often, arriving at solutions within the colonial system simply leads to the replication of colonial harm.

In some instances, renewable energy projects - including solar, wind and hydro - are being constructed on our lands and territories without our consent. This has resulted in numerous instances of Indigenous opposition and legal challenges to renewable energy projects. While the projects themselves might lower greenhouse gas (GHG) emissions, they still create systems of harm and violations of Indigenous rights, including our right to Free, Prior and Informed Consent as outlined in the international **UN Declaration on the Rights of Indigenous Peoples**. Even within renewable energy sectors, we continue to witness status quo violence: the claiming of Indigenous lands for the benefit of non-Indigenous peoples and corporations.

As discourse around a just transition evolves into the mainstream, it is essential to speak to the harm and violations of Indigenous rights within the production and extraction of materials that are required for energy storage. Specifically, the mining of lithium for lithium-ion batteries which power many modern devices [such as phones, laptops], electric vehicles, and renewable energy systems.<sup>47</sup> The environmental and health impacts from lithium mining are severe. Communities experiencing lithium mining in their area are facing air and water pollution, soil erosion, disruption of wildlife habitats, increased respiratory problems and much more.<sup>48,49</sup> On top of these serious repercussions, lithium mining requires about 500,000 liters of water per ton, and can result in the poisoning of reservoirs or streams used for humans, animals and livestock, and crop irrigation.<sup>50</sup> For Indigenous peoples, the impacts of lithium mining are also beyond the environment, and have lasting implications on their sovereignty and governance.

Indigenous communities are facing loss of lands and environmental health impact, as well as a lack of self-determination in the decision-making processes and the environment and resource management of their territories. Whether or not Indigenous communities want lithium mining in their territories, jurisdiction needs to be with the communities as self-determining Nations.

Minimal jurisdiction over mining is a growing concern for Indigenous Nations and communities in Canada, since the federal government has identified several key minerals such as lithium and nickel as “critical” because they are key materials in the renewable energy transition, and because “Canada has the potential to be a supplier.”<sup>51</sup> In the far north of Ontario, in the area known to many as the ‘Ring of Fire,’ conflict has arisen over colonial interest in nickel extraction. Neskantaga First Nation has been a vocal opponent, making forceful public declarations against incursions by mining companies on their homelands,

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47. Merriam Webster. (n.d.). Greenwashing. Merriam Webster. <https://www.merriam-webster.com/dictionary/greenwashing>

48. Houle, R. (2022). Redwashing Extraction: Indigenous Relations at Canada’s Five Big Banks. Yellowhead Institute. <https://yellowheadinstitute.org/wp-content/uploads/2022/08/Redwashing-Extraction-YI-Special-Report-8.22-1.pdf>

49. Tedesco, Marco. (2023). The Paradox of Lithium. Columbia Climate School. <https://news.climate.columbia.edu/2023/01/18/the-paradox-of-lithium/#:~:text=These%20side%20effects%20include%3A%20use,interests%20at%20stake%20are%20enormous>

50. Katwala, Amit. (2018). The spiralling environmental cost of our lithium battery addiction. Wired. <https://www.wired.co.uk/article/lithium-batteries-environment-impact>

51. Government of Canada. (2023). Lithium Facts. <https://natural-resources.canada.ca/our-natural-resources/minerals-mining/minerals-metals-facts/lithium-facts/24009>

exclaiming “no consent, means no mining”. Neskantaga, along with Kitchenuhmaykoosib Inninuwug, Muskrat Dam, Grassy Narrows and Wapekeka First Nations have come together and formed the First Nations Land Defence Alliance to push for free, prior, and informed consent, as well as against

environmental health impacts.<sup>52</sup> Communities are actively asserting their jurisdiction over the decision to pursue mining on their territories, and for Canada to implement a ‘just’ transition, they must accept their right to self-determination.

As Canada pushes to open mines to supply increasing renewable energy, the disregard for Indigenous self-determination spans across colonial borders as their interests in mining are worldwide, especially in South America.<sup>53</sup> In 2018, there was \$56.6 billion in Canadian mining assets across South America. With Canada’s monopoly over lithium mining in South America, the government holds vast influence over the environment as well as the political sphere.<sup>54</sup> Much of their mining operations have created an influx of Indigenous displacement and forced migration due to loss of land and water. Where Bolivia, Chile, and Argentina meet in South America, this area holds more than half the amount of lithium in the world and is one of the driest places on earth. Subsequently, creating immense issues around water for many Indigenous communities around mining who depend on water for agriculture. For example, in Chile’s Salar de Atacama, mining operations consume 65% of the region’s water.<sup>55</sup> Many communities are facing the impact of poisoned water supplies through the leaking of toxic chemicals like hydrochloric acid from the evaporation pools in the lithium mining process.<sup>56</sup> The impact is detrimental, and Indigenous peoples have been consistently advocating against these harms. The increase in Indigenous rights in Bolivia has impacted Canada’s access to their territories for mining, so the country is focusing on Chile and Argentina for future investments.<sup>57</sup> Canada knows the power Indigenous Nations have. Momentum behind Indigenous rights movements are directly impacting Canada’s mining industry, and displays the indispensability of solidarity among Indigenous Nations to hold the Canadian government accountable for their exploitative mining practices in South America.

Lowering emissions is not going to help the environments impacted by industry. There are severe implications being faced by Indigenous communities because of the clean energy transition and lithium mining, and to not replicate the same inequities of the fossil fuel industry, there needs to be clear acknowledgement to invest and explore alternatives that have minimal impact to Indigenous health and well-being. Throughout this guide, there will be many renewable energy solutions introduced. These solutions are not to be presented as the “end all - be all” solutions to fix the climate crisis, but to provide a sense of a different path forward, one where there are alternatives to fossil fuels. As we witness the energy transition upon us, there is a necessity to stay critical of climate solutions and steer clear of greenwashing.

Not only are renewable energy projects used to perpetuate systems of colonization for the benefit of non-Indigenous peoples and cities, governments and oil and gas corporations are using renewable energy projects as a way to greenwash their bad reputation.

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52. McIntosh, Emma. (2023). ‘No Consent, no Ring of Fire’: Far North First Nations take mining battle straight to Ontario legislature. The Narwhal. <https://thenarwhal.ca/ring-of-fire-first-nations-queens-park/>

53. Meisner, Liam. (2021). Canadian mining companies are devastating the global south. The Maple. <https://www.readthemaple.com/canadian-mining-companies-are-devastating-the-global-south/>

54. Kasonga, Monique. (2022). Canadian mining: Putting a price on Latin American lives. The Tribune. <https://www.tribune.ca/opinion/the-true-cost-of-mining-112822/>

55. Katwala, Amit. (2018). The spiralling environmental cost of our lithium battery addiction. Wired. <https://www.wired.co.uk/article/lithium-batteries-environment-impact>

56. Ibid.

57. Government of Canada. (2023). Lithium Facts. <https://natural-resources.canada.ca/our-natural-resources/minerals-mining/minerals-metals-facts/lithium-facts/24009>

The definition of greenwashing as it appears in the Merriam Webster dictionary is clear: “the act or practice of making a product, policy, activity, etc. appear to be more environmentally friendly or less environmentally damaging than it really is.”<sup>58</sup>

In other words, greenwashing is when oil and gas companies support the creation of renewable energy projects to market themselves as “sustainable” while in reality they continue to produce millions (if not billions) of tonnes of GHGs through existing oil and gas projects. Many oil and gas corporations look for impoverished Indigenous communities to partner with on both renewable and oil and gas energy projects in order to not only greenwash their business but “redwash” them as well. According to the **Yellowhead Institute**, “similar to ‘greenwashing’...redwashing is an attempt to craft an appearance of reconciliation, or being generous - reconciliation in a purely superficial conceptualization.”<sup>59</sup>

A Just Transition that truly embodies climate justice requires that we look at more than just emission reductions - and challenges us to explore how not all is as it seems. Sometimes renewable energy can be held up as a false solution, propping up ongoing colonization via greenwashing and redwashing. In addition, the scale or size of a renewable energy project determines whether or not it is creating more harm than good.

A Just transition plays an important role in the lowering of GHG emissions and in achieving energy sovereignty. At the same time, we need to truly understand that the limitations of available renewable energy technologies represent a trade-off - this becomes extra clear when we observe exactly who it is that benefits from large-scale projects which do little to address the socio-economic challenges of our communities. It is important to consider these issues as we build a just climate future. In some cases, large-scale energy projects - regardless of their renewable energy label - can have destructive and detrimental consequences on our lands, waterways, ways of being, and inherent rights. Our communities, lands, territories, and people must no longer be sacrificed by industrial extractive economies that simply don't uplift climate justice.

Despite the risk of replicating the same systems of harm that we see in the fossil fuel regime, a Just Transition is possible. If we find meaningful ways to address systemic injustices when implementing renewable energy, thereby restoring meaningful energy sovereignty to communities across Turtle Island, it is even likely.

In this Guide, we invite you on a journey: we will explore renewable energy and Indigenous Just Transition models, opportunities, and stories of success. We recognize that this is not an exhaustive list of Indigenous Nations and communities working in the renewable energy sector within so-called Canada, as there are hundreds of Indigenous-led projects across the country. Nonetheless, this guide is an offering to help you on your own path towards a Just Transition.



58. Merriam Webster. (N.d.). Greenwashing. Merriam Webster. <https://www.merriam-webster.com/dictionary/greenwashing>

59. Houle, R. (2022). Redwashing Extraction: Indigenous Relations at Canada's Five Big Banks. Yellowhead Institute. <https://yellowheadinstitute.org/wp-content/uploads/2022/08/Redwashing-Extraction-YI-Special-Report-8.22-1.pdf>



# ENERGY AND ELECTRICITY SYSTEMS

## 2.1

### SO-CALLED CANADA'S ENERGY AND ELECTRICITY CONTEXT

For a country with a relatively small population, so-called Canada has enormous environmental and carbon footprints. A 2018 review of so-called Canada's energy outlook found that the country is among the most voracious oil consuming countries in the world, using five times the world average.<sup>60</sup> So-called Canada is also a high per capita consumer of natural gas, at 5.8 times the global average.<sup>61</sup> In addition to above-average energy production and consumption, so-called Canada has an enormous electricity addiction. According to a 2019 study, the country produced 632.40 billion kilowatt hours (kWh) of electricity per year and consumed 16,904 kWh per person - a number triple that of the average European citizen.<sup>62,63</sup>

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60. Houle, R. (2022). Redwashing Extraction: Indigenous Relations at Canada's Five Big Banks. Yellowhead Institute. <https://yellowheadinstitute.org/wp-content/uploads/2022/08/Redwashing-Extraction-YI-Special-Report-8.22-1.pdf>

61. Hughes, David. (2018). Canada's Energy Outlook: Current Realities and Implications for a Carbon Constrained Future. Canadian Centre for Policy Alternatives. [https://ccpabc2018.files.wordpress.com/2018/04/cmp\\_canadas-energy-outlook-2018\\_full.pdf](https://ccpabc2018.files.wordpress.com/2018/04/cmp_canadas-energy-outlook-2018_full.pdf).

62. Ibid.

63. Ritchie, Hannah & M. Roser. (2020). Per Capita Electricity Consumption. Our World in Data. <https://ourworldindata.org/grapher/per-capita-electricity-consumption>.

But we now have the ability to align our energy demand with our values. “Indigenous communities are on the frontlines against resource extraction and climate change, and we are also on the frontlines of solutions. For the first time since the age of industrialization, technology now exists that is more reflective of our sacred relationship with the land, air and water.”<sup>64</sup> Reducing energy demand, thereby lessening our impacts, grants us an opportunity to increase energy efficiency - which, in turn, lowers the overall electricity demand of a given community. The reduction of energy demand is also helpful for determining the energy needs of a community and the appropriate type and scale of your renewable energy project.

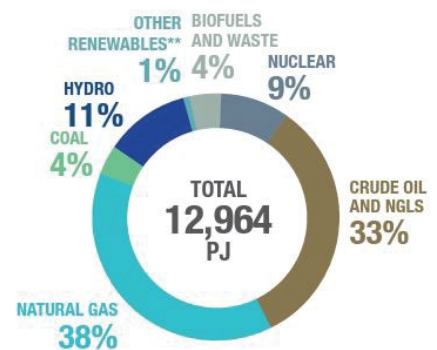
Indigenous participation in addressing so-called Canada’s energy and electricity systems challenges is critical if we are to help the climate and the planet heal, especially considering that over 81% of the country’s emissions come from energy.<sup>65</sup>

## 2.2 ENERGY GENERATION AND GRIDS IN SO-CALLED CANADA

### WHAT IS THE “GRID”?

When we refer to “the grid” we usually refer to the interconnected and complex web of electricity production, transmission, storage, and consumption across Turtle Island. For communities looking to connect their renewable energy projects to the grid, it is important to know which local electric utility the project will be connected to. It should be noted that Indigenous peoples have historically been and continue to be excluded from the creation and design of energy generation and grid systems. Ultimately, this has resulted in many of our communities remaining disconnected or not benefiting from the current structures and energies they produce. An example of this can be seen in Gull Bay First Nation, which was profiled in *Power to the People*, Episode 13.<sup>67</sup>

CANADA TOTAL PRIMARY ENERGY SUPPLY,\* BY SOURCE, 2019



\* not including electricity trade  
 \*\*\*Other renewables\* includes wind, solar and geothermal.

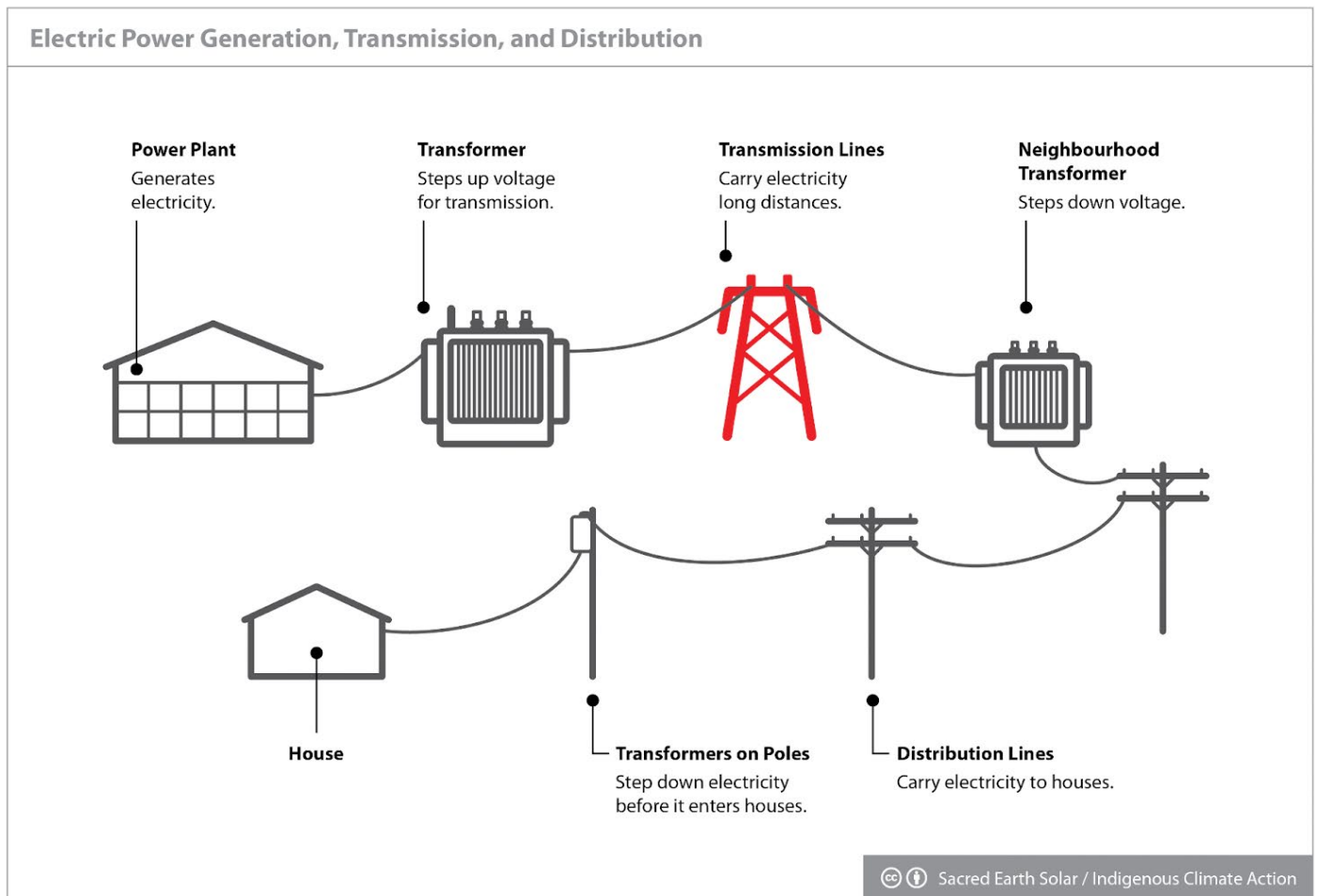
Figure 2. So-called Canada’s Total Primary Energy Supply in 2019 (Source: Natural Resources Canada)

- 64. Ritchie, Hannah and M. Roser. (2020). Electricity Generation. Our World in Data. [https://ourworldindata.org/grapher/electricity-generation?](https://ourworldindata.org/grapher/electricity-generation?locations=CA)
- 65. Laboucan-Massimo, Melina. (2015). Pî tâpan: Community Based Solar and Energy Sovereignty in the Tar Sands. [Unpublished Master’s thesis]. University of Victoria.
- 66. Canada Energy Regulator. (2021). Provincial and Territorial Energy Profiles – Canada. Government of Canada. <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-canada.html>.
- 67. Canada Energy Regulator. (2021). Provincial and Territorial Energy Profiles – Canada. Government of Canada. <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-canada.html>.

The “**electric grid**” refers to a system of energy generation, transmission, and distribution, which is composed of three major parts:

- Devices that generate electricity
- Devices that conduct and safely regulate the flow of electricity
- Devices that consume electricity <sup>68,69</sup>

For more details on the components of the grid, please see the Key Terms section.



**Figure 3.** Conventional centralized electrical power generation (Source: SES/ICA)

68. Canadian Electricity Association. (2021). North American Power Grid. Canadian Electricity Association. <https://electricity.ca/learn/electricity-today/north-american-power-grid/>

69. Energy Education. (2020). Electrical Grid. University of Calgary. [https://energyeducation.ca/encyclopedia/Electrical\\_grid](https://energyeducation.ca/encyclopedia/Electrical_grid)

In Canada there are many local electricity providers that operate differently and are distinct to each province and territory. It is important to understand the differences between all of the provincial and territorial power grids, their respective energy producers, the energy policy that governs these grid systems, and how it affects the communities they are intended to serve. Most provinces and territories provide electricity through a government-dominant utility company (also known as provincially or territorially-owned, publicly-owned, or municipally-owned utilities).<sup>70</sup> Although they are understood as publicly-owned utilities, these companies have what is known as a “regulated monopoly” on providing electricity.<sup>71</sup> Some provinces, such as Alberta and PEI, use privatized or investor-owned utilities.<sup>72</sup>

If you need to find your local utility, you can consult this description of the **Canadian electric system** or **The Canadian Electric Association Membership List** (CEA). CEA is Canada's electricity industry lobby group and represents many electricity providers.

There are also **“Independent Power Producers”** (IPPs), which are non-utility entities that own an electricity generation system and sell electricity to utility companies and end-users.<sup>73</sup> Some Indigenous communities choose to become IPPs, or work in partnership with other companies. There are many different ownership models that may be considered when planning a renewable energy project.

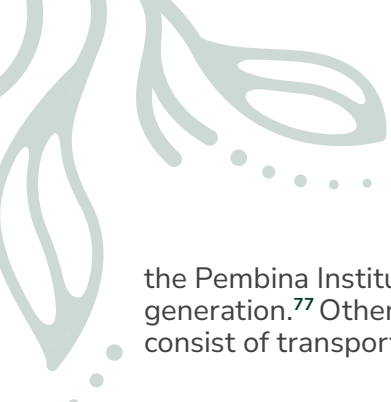
Figure 3, to the left, is a rendering of Canada's transmission lines.

Communities that are not connected to the broader electricity network are considered “off-grid.” Over 170 Indigenous communities are considered off-grid, and in many cases do not directly benefit from energy extraction projects on their lands and territories.<sup>74</sup> Due to limited sustainable options - most remote off-grid communities rely primarily on diesel-fired generation, which is expensive, produces significant GHG emissions, and strains the already stressed socio-economic systems of our communities<sup>75,76</sup> According to a study by



**Figure 4.** Map of Canada's transmission line network (Source: Canadian Geographic)

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70. Lee, Po-chih, and E.W. Humphrys. (2006). Electric Utilities. The Canadian Encyclopedia. <https://www.thecanadianencyclopedia.ca/en/article/electric-utilities>
71. Zizzo, Laura, Allan, T., & Kyriazis, J. (2014). Understanding Canadian Electricity Generation and Transmission Sectors' Action and Awareness on Climate Change and Need to Adapt. Zizzo Allan Professional Corporation.
72. Lee, Po-chih, and E.W. Humphrys. (2006). Electric Utilities. The Canadian Encyclopedia. <https://www.thecanadianencyclopedia.ca/en/article/electric-utilities>
73. Quitaras, Marvin. (2021). "What's a fair and equitable price for renewable energy in remote communities?". Pembina Institute. <https://www.pembina.org/blog/whats-fair-and-equitable-price-renewable-energy-remote-communities>.
74. Canada Energy Regulator. (2018). Market Snapshot: Overcoming the challenges of powering Canada's off-grid communities. Government of Canada, <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshot-overcoming-challenges-powering-canadas-off-grid-communities.html>.
75. Canada Energy Regulator. (2018). Market Snapshot: Overcoming the challenges of powering Canada's off-grid communities. Government of Canada, <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshot-overcoming-challenges-powering-canadas-off-grid-communities.html>.
76. Natural Resources Canada. (2020). Reducing diesel energy in rural and remote communities. Government of Canada. <https://www.nrcan.gc.ca/climate-change/green-infrastructure-programs/reducing-diesel-energy-rural-and-remote-communities/20542>.



the Pembina Institute, as much as 79% of the electricity used in remote communities comes from diesel generation.<sup>77</sup> Other off-grid communities rely on smaller local or regional electricity grids, which may consist of transported liquefied natural gas or renewable energy.<sup>78</sup>

## CANADA'S GRID INEFFICIENCIES

Canada's intra-provincial and territorial electrical transmission infrastructure is becoming increasingly outdated and inefficient. The centralized nature of the electric grid overlooks significant inefficiencies and is becoming more and more vulnerable to widespread outages caused by severe weather events.<sup>79,80</sup> These inefficiencies leave Indigenous communities vulnerable to the prioritization of urban and non-Indigenous communities, which, in turn, leads to the disruption of Indigenous livelihoods. The country's electricity infrastructure is limited due to a lack of high voltage transmission lines and methods for storing large amounts of power.<sup>81</sup> Energy often needs to travel great distances to reach communities, leading to energy losses.<sup>82</sup>

According to a 2011 CBC News article, Hydro-Quebec estimates that between 4.5-8% of power is lost between their James Bay hydro generator and Montreal (a distance of over 1,000 kilometres), depending on outdoor temperatures and other conditions.<sup>83</sup> This is equivalent to hundreds of megawatts lost, or the entire capacity of a small power station.

Only about a third of the energy allotted for domestic use in so-called Canada is considered "useful energy." The remaining two-thirds are either consumed by the energy industry in the production phase of primary energy sources or are lost in the conversion phase of a primary source to electricity or to other secondary sources of energy. Only a small fraction of energy losses occur after reaching the end-user.<sup>84</sup>

The Canadian and US power systems are highly integrated, with over 35 transmission interconnections forming a cross-border North American power transmission grid. However, the grid's infrastructure was initially designed for transmitting electricity from large, centralized power plants - which primarily use dirty fuel sources such as coal, oil, and natural gas.

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78. Ibid

79. Zizzo, Laura, Allan, T., & Kyriazis, J. (2014). Understanding Canadian Electricity Generation and Transmission Sectors' Action and Awareness on Climate Change and Need to Adapt. Zizzo Allan Professional Corporation.

80. Romero-Lankao, P., et al. (2014). North America. In: Barros, V.R., Field, C.B., Dokken, D.J., Mastrandrea, M.D., Mach, K.J., Bilir, T.E., Chatterjee, M., Ebi, K.L. and Estrada, R.C.G.Y.O., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R. and White, L.L., Eds., Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge.

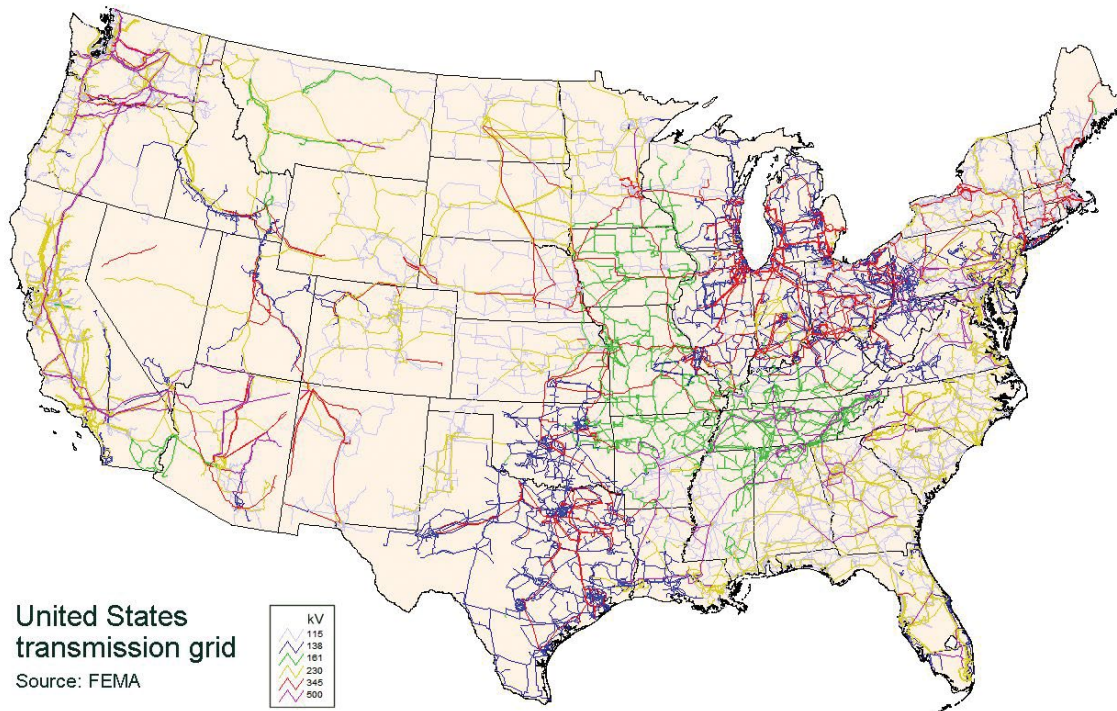
81. Bordeleau, Stéphane. (2011). Where Canada's surplus energy goes. CBC News.  
<https://www.cbc.ca/news/canada/where-canada-s-surplus-energy-goes-1.1109321>.

82. Chung, Emily. (2011). Green power projects hit unexpected hurdles. CBC News.  
<https://www.cbc.ca/news/canada/green-power-projects-hit-unexpected-hurdles-1.1058196>.

83. Ibid

84. Generation Energy. (2018). Canada's Energy Transition: Getting to Our Energy Future, Together. Generation Energy Council.





**Figure 5.** Map of the electric grid South of the Medicine Line (Source: **Wikimedia Commons**)

In this top down, industrial model, governments are increasingly adopting a privatized electricity model<sup>87</sup>- one in which power literally rests in the hands of the few.

Founding CEO of BluEarth Renewables Inc., Kent Brown, puts it all into perspective:

*“It used to be all large, Crown-owned utilities, but governments are moving towards this [privatized] model in concerted ways. Power from large distant power projects feeds into a transmission network that transfers it to a distribution network, which in turn carries the power to customers. Small, green energy projects, on the other hand, feed straight into the lower voltage distribution grid that connects to people’s homes.”<sup>88</sup>*

87. Evans, Pete. (2011). Privatization of Canada’s Electrical Grid Accelerating. CBC News. <https://www.cbc.ca/news/business/privatization-of-canada-s-electrical-grid-accelerating-1.1016930#>.  
88. Chung, Emily. (2011). Green power projects hit unexpected hurdles. CBC News. <https://www.cbc.ca/news/canada/green-power-projects-hit-unexpected-hurdles-1.1058196>.

If our current energy system is not upgraded, we risk over-relying on natural gas, propane, and diesel, rather than building momentum towards renewable energy.<sup>89</sup> Our new energy system should be designed to manage wind and solar variability, connect to sources of high renewable generation potential, reduce electricity loss during transmission, and accommodate local sources of power.<sup>90</sup>

While our current grid was designed for constant, centralized power production - establishing a more decentralized electric grid is critical to transitioning to renewable energy, as it can cut energy loss during distribution and account for the variability of solar and wind power.<sup>91</sup> Technologies that contribute to grid flexibility include constant renewables (such as geothermal), utility-scale (large-scale) and small-scale energy storage, and demand response tools (such as energy efficient appliances).<sup>92</sup>

If an electric generation facility is connected to the continental electric grid, it is not possible to know where that electricity eventually ends up. The nature of electricity is such that it is potentially - and instantly - available at all points on a grid. When communities are connected to the grid, they usually receive renewable energy credits from energy distributors, which helps reduce the cost of what they pay for the electricity.

Re-imagining this infrastructure and creating progressive renewable energy policy directly supports energy sovereignty in Indigenous communities. By re-establishing our right to self-determination, which is good for Mother Earth, we can move towards owning and operating more efficient, regional energy systems. In doing so, we generate sustainable jobs and more revenue for communities. And by offsetting expensive energy costs, we also reduce the overall cost of living.

## **2.3 ENERGY CONSERVATION AND EFFICIENCY**

One of the first steps we can take towards the Just Transition is reducing our energy demand - via conservation and/or efficiency. While **energy conservation** is the practice of simply using less energy, **energy efficiency** refers to the use of technology to reduce energy demand.<sup>93</sup> Energy efficient technologies reduce the amount of energy required to provide products and services and can be used in housing, buildings, communities, industry, and transportation.<sup>94</sup> In addition to reducing the environmental footprint of the energy system, increased energy conservation and efficiency can also lower the energy

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89. Union of Concerned Scientists. (2017). It's Time to Upgrade the Electricity Grid. Union of Concerned Scientists. <https://www.ucsusa.org/resources/lets-upgrade-electricity-grid>.

90. Ibid

91. Project Drawdown. (2020). Grid Flexibility. Project Drawdown. <https://drawdown.org/solutions/grid-flexibility>.

92. Ibid.

93. U.S. Energy Information Administration. (2020). Use of energy explained: Energy efficiency and conservation. U.S. Energy Information Administration. <https://www.eia.gov/energyexplained/use-of-energy/efficiency-and-conservation.php>.

94. Natural Resources Canada. (2020). Energy Efficiency. Government of Canada. <https://www.nrcan.gc.ca/energy-efficiency/10832>.

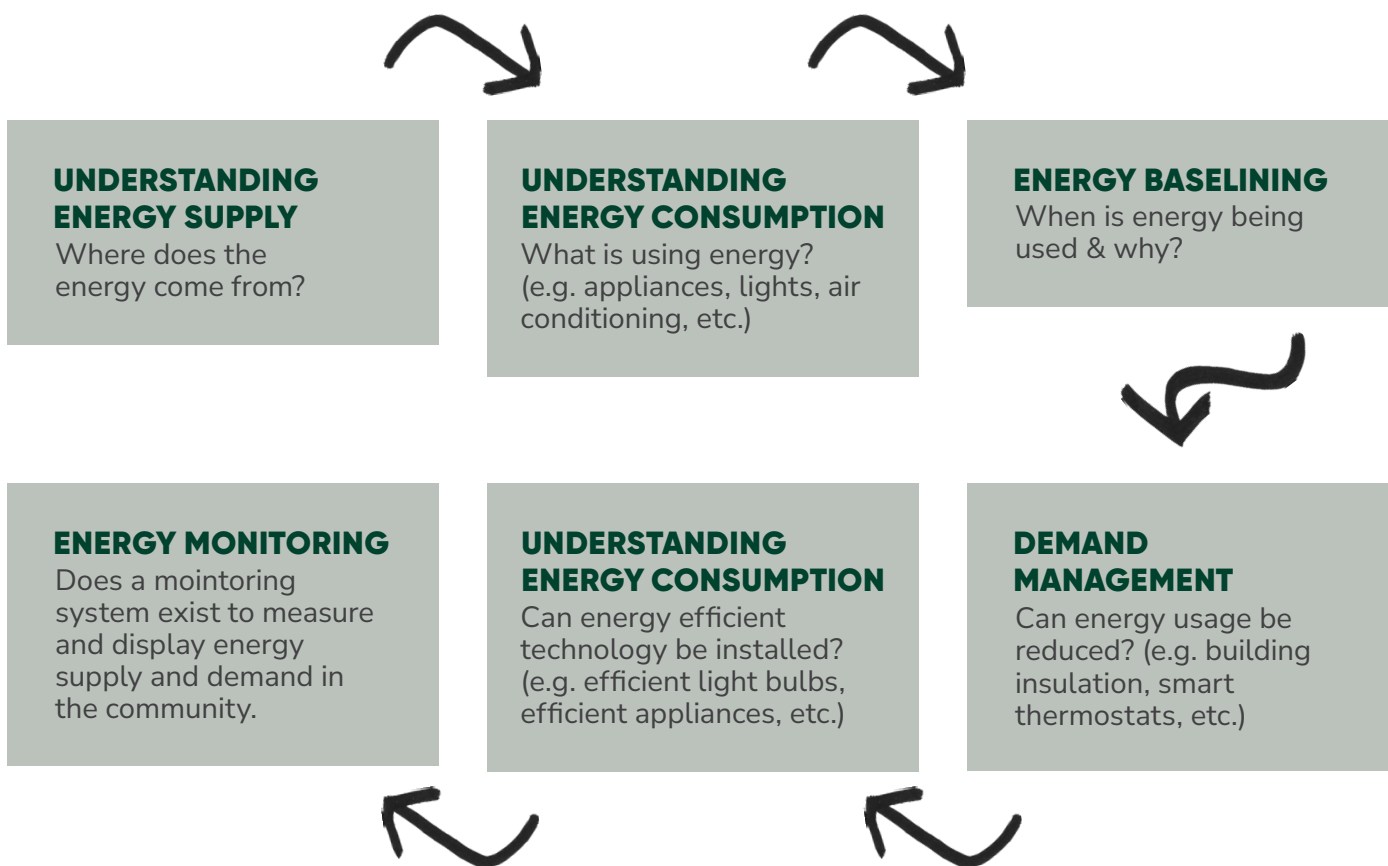
95. Ibid.

bills of community members, improve the operating performance of appliances, and increase asset values.<sup>95</sup>

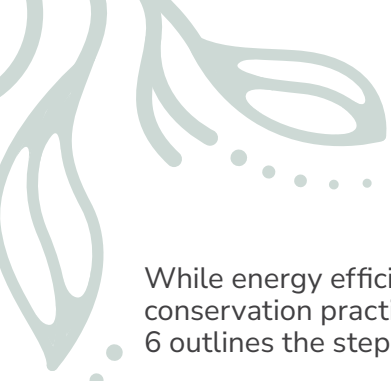
*It is important to understand that energy efficiency needs to happen before renewable energy projects are built.*

Energy conservation, improved energy efficiency, and **demand-side management** (initiatives and technologies that encourage communities and individual consumers alike to optimize their energy use), are all an integral part of achieving a Just Transition. By implementing energy conservation and efficiency standards in your community, you can help to reduce the overall demand for electricity and better select the right size and type of renewable energy project(s) for your community.

As our communities replace colonial-imposed carbon-intensive energy sources in our shift to clean energy, designing new holistic energy systems and retrofitting existing ones will be pivotal in transforming our energy future to align with our values. Energy conservation and efficiency are consistent with the value we place on sustaining future generations. These practices and technologies will allow us to access the energy we need in a way that is more efficient, less wasteful, and less costly.



**Figure 6.** Process for understanding and monitoring energy supply and consumption, as well as implementing energy efficiency and demand management (Source: Shahed Shafazand)



While energy efficiency may require some initial capital, and returns may not be visible at first, energy conservation practices can usually be implemented at very little or no cost to community members. Figure 6 outlines the steps needed to start an energy conservation project:

Indigenous communities often face inadequate housing with low energy efficiency, high energy costs, and insufficient upgrades and maintenance. Though there are many recommended methods for reducing energy consumption and increasing energy efficiency in a building or a house, best practices will differ depending on the community, local energy needs, and resources available. The most common practices include:

- CFL or LED bulbs for lighting: Halogen incandescent bulbs, compact fluorescent lights (CFLs), and light-emitting diode bulbs (LEDs) use 25-80% less electricity and last 3-25 times longer than traditional bulbs.<sup>96</sup>
- Programmable thermostats: Programmable thermostats can be set to automatically turn off or reduce heating and cooling when you are asleep or away from home, which reduces wasteful energy use.<sup>97</sup>
- Energy efficient appliances: Appliances are responsible for approximately 13% of total household energy use. Despite higher upfront purchase prices, the annual operating costs of energy efficient appliances are often 9-25% lower than conventional models.<sup>98</sup>
- Heating system retrofits: Retrofitting a heating system means transforming it into a new system that is more efficient and/or uses a more affordable fuel. Examples include: air-source heat pumps, ground-source heat pumps, and biomass heating.

Heat pumps are one of the most effective and least complex pathways to reducing heating expenses for rural and remote communities. This technology has a lower operating cost than electric resistance heating, heating oil, propane, or wood heating, while also producing fewer greenhouse gas emissions.

Electric heat pumps are 3-4 times more efficient than other heating equipment, including electric baseboards and gas furnaces, and can help improve ventilation and air quality issues in homes. Using newer heat pump technologies has the potential to bring operating costs in line with the cost of heating with conventional fossil fuels, like natural gas. That being said, the initial capital cost of a heat pump remains high and can be a barrier for some homes.

To address this issue, some provinces, territories and municipalities are offering rebates to support the installation of heat pumps. For example, British Columbia's 2018 CleanBC plan introduced rebates of up to \$10,000 for customers switching from fossil fuel heating to electric heat pumps. In addition to the provincial rebates, several municipalities in British Columbia have introduced **incentives** ranging from \$350 to \$6,000. The **Indigenous Community Heat Pump Incentive**, as part of the Indigenous Energy Coach program, offers incentives for Indigenous communities up to \$10,000 or 80% of the capital, installation, and other associated costs of installing electric heat pumps.

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96. EnergySage. (2021). Energy conservation: 10 ways to save energy. EnergySage. <https://www.energysage.com/energy-efficiency/101/ways-to-save-energy/>.

97. Ibid.

98. Ibid.

99. Ecotrust Canada. (2020). Moving Toward Energy Security in British Columbia's Rural, Remote, and Indigenous Communities. Ecotrust Canada. [https://ecotrust.ca/wp-content/uploads/2020/03/EnergySecurity-Policy-Report\\_EcotrustCanada\\_2019\\_Updated\\_WEB.pdf](https://ecotrust.ca/wp-content/uploads/2020/03/EnergySecurity-Policy-Report_EcotrustCanada_2019_Updated_WEB.pdf).

100. Ibid.

The Benefits of building envelope retrofits: There are thousands of homes in First Nations communities that need upgrades to make them safe, liveable, and energy-efficient. Building envelope retrofits reduces energy demands by decreasing air leakage and improving insulation. Retrofits can be combined with ventilation improvements to simultaneously improve air quality.<sup>99</sup> Examples of retrofits include upgrading doors and windows, installing high R-value insulation, and sealing leaks in high heat loss areas:

- Energy efficient windows: windows can add 10-25% to your total heating bill. To prevent heat loss, single-pane windows can be replaced with double or triple-pane ones. In colder regions, gas-filled windows with “low-e” coatings can minimize heat loss and reduce heat gain by reflecting light and lowering the amount of thermal energy that enters your home. Interior or exterior storm windows can also reduce unnecessary heat loss by 10-20%.<sup>100</sup>
- Weatherizing: weatherizing reduces air leaks into your home - most commonly around vents, windows, and doors. To prevent and seal these leaks, fill cracks or openings with caulk or weather stripping.
- Insulating: insulation lowers utility bills by retaining heat during the winter and keeping heat out of your home during the summer.

Energy conservation can be integrated into everyday life. An important component of these practices is education and advocacy which encourages individuals and communities to adopt day-to-day usage practices that are energy conscious. The principles of energy systems and the importance of conservation can be communicated with games and fun activities to encourage participation in projects and nourish new ideas.

There are also provincial, territorial, and municipal energy conservation programs that are designed to improve conservation and efficiency initiatives in communities. **The Indigenous Communities Conservation Program (ICCP)** is an example of a regional program in BC that is designed to engage and train Indigenous community members to lead energy saving efforts in their communities.



Figure 7: Melina Laboucan-Massimo engages in climate literacy games with youth in her community of Little Buffalo. (photo credit: Sacred Earth Solar)

## 2.4

## THE PATH FORWARD

*“A just recovery must prioritize communities that are already impacted by dirty fossil fuels. A Just Transition means our communities will no longer be sacrifice zones.”*

**MELINA LABOUCAN-MASSIMO**

Lubicon Cree First Nation  
Founder of Sacred Earth Solar

*“We used the renewable energy sector to reverse the adverse effects of colonization - we have no social assistance, we have no children in care, we have 100% employment, we have 100% graduation, and we build capacity.”<sup>101</sup>*

**CHIEF PATRICK MICHELL**

Kanaka Bar First Nation

*“I think there is a sense of pride that our community members get from this project. We did that as a community, our leaders did that. The wind farm was created to generate revenues so that all three communities could benefit and grow the Nation.”<sup>102</sup>*

**KIRT DEDAM**

Project Manager at Mesgi’g Ugju’s’n Energies Inc.

**Right Figure 8:** Six Nations of the Grand River Development Corporation Solar Project implementation beside the Nanticoke refinery. (photo credit: Power to the People, Real World Media)

101. RealWorld Media. (2020). Power to the People. Episode 9: Kanaka Bar. APTN.

<https://www.aptnv.ca/powertothepeople/video/season-1/>

102. Dedam, Kirt. (2021). Personal communication regarding Mesgi’ug Ugju’s’n Wind Farm [Personal Interview].

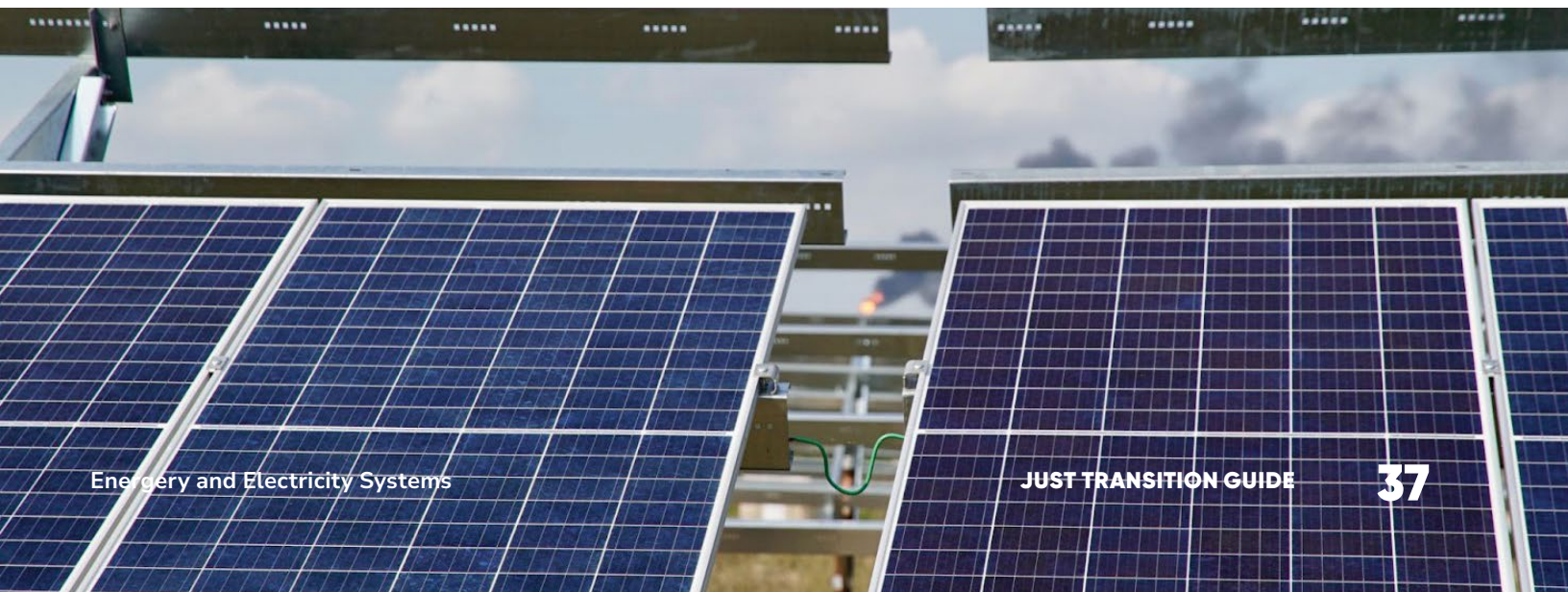
103. Hoodwinked in the Hothouse. (2021). “Resist False Solutions to Climate Change”. Third Edition. California.

*“Renewable energy can be part of real solutions to climate change, but there are quite a few caveats. In the spirit of greenwashing, many things may be labeled renewable energy that are actually false solutions. Several of the energy sources [...] sometimes considered renewable energy but can exacerbate climate change and cause a great deal of harm to the environment and communities including: Biomass, biofuels, incineration, landfill gas-to-energy, hydrogen, “renewable natural gas” or factory farm methane digesters, nuclear and corporate hydropower. Solar and wind can be genuinely renewable sources of energy. However, Earth’s limits, distance, economics and social justice all play roles in determining whether these energy sources are truly renewable or sustainable.”<sup>103</sup>*

Hoodwinked in the Hothouse, Third Edition

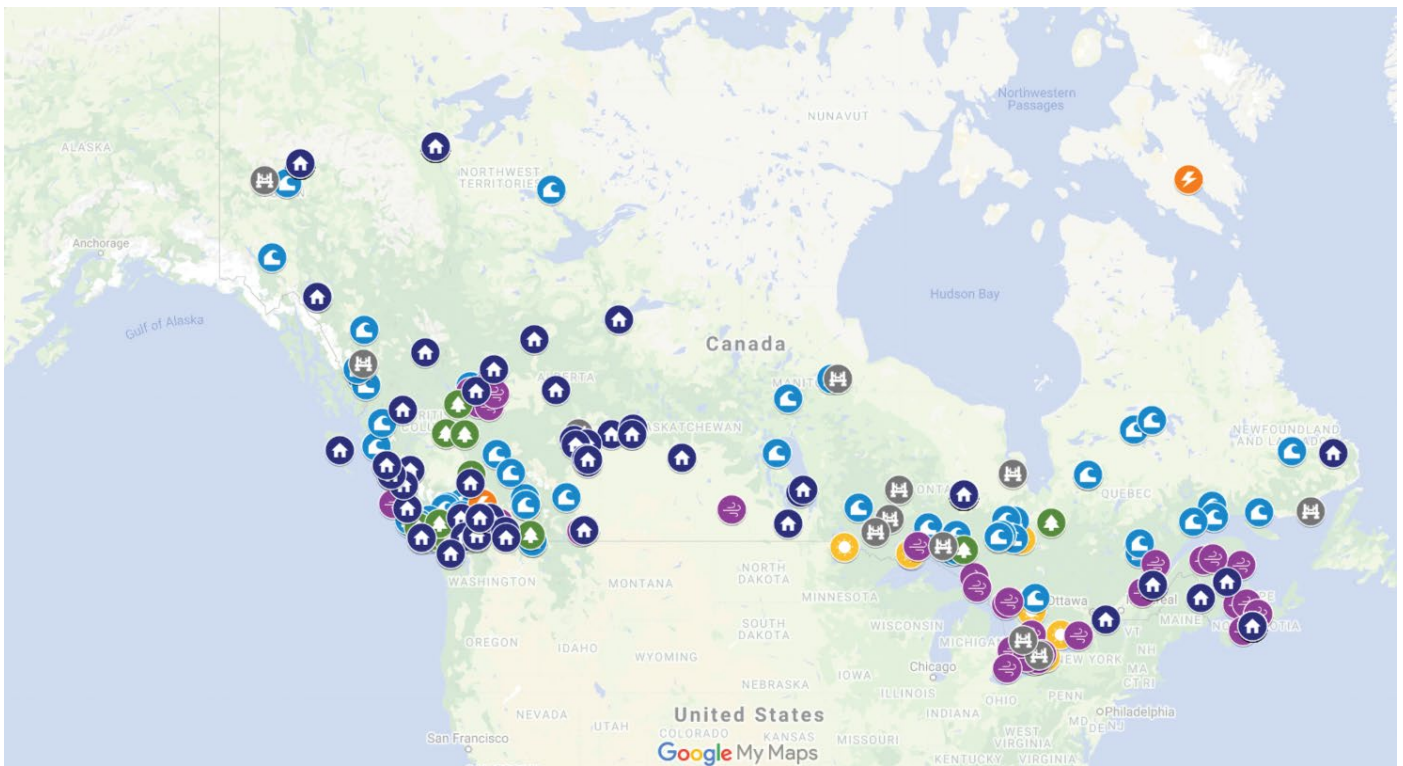
Implementing renewable energy solutions and increasing energy efficiency helps communities transition away from fossil fuel-dependency, which simultaneously ensures the health of Indigenous families and allows us to assert our sovereign energy systems and structures. It also strengthens our ability to assert our inherent and treaty rights - including the right to develop our own economic and governance systems. As explored in our ‘Wisdom from Communities’ sections, the transition to renewable energy systems can lead to long-term self-reliance, economic stability, increased community pride, improved health, and the retention of community members otherwise lost to economic urban centers.

From Mi’kmaq to Tlingit, Coast Salish to Six Nations, and Inuit to Cree territories, the time has come for our communities to demand renewable energy that is in line with our ways of life and cultural values. There is a trend, driven by reconciliation, for renewable energy producers to partner with Indigenous Peoples and communities across Turtle Island.



Nearly 200 medium to large-scale renewable energy projects with Indigenous involvement are now in operation or in the final stages of planning or construction. Most of these projects involve partnerships between Indigenous communities and energy sector companies, utilities, or developers. Smaller clean energy projects are proliferating as well, with many Indigenous communities installing community-scale or small-generation solar systems supplying provincial/territorial grids. It is estimated that 1,700 - 2,100 micro or small renewable energy systems with Indigenous leadership/partnerships are now in place.<sup>104</sup>

However, we need to continue to challenge the systems and processes of renewable energy development to ensure we move towards equitable partnerships and fully independent operators and beneficiaries.<sup>105</sup> As demonstrated in our ‘Wisdom from Communities’ sections, the current standards for renewable energy are still predetermined by colonial systems and often exclude Indigenous wisdom.



**Figure 9.** A map of Indigenous clean energy projects (Source: Indigenous Clean Energy)

**104.** Indigenous Clean Energy. (2022). Indigenous-led Clean Energy Project Map. Indigenous Clean Energy. <https://indigenouscleanenergy.com/connect-learn/indigenous-led-clean-energy-project-map/>

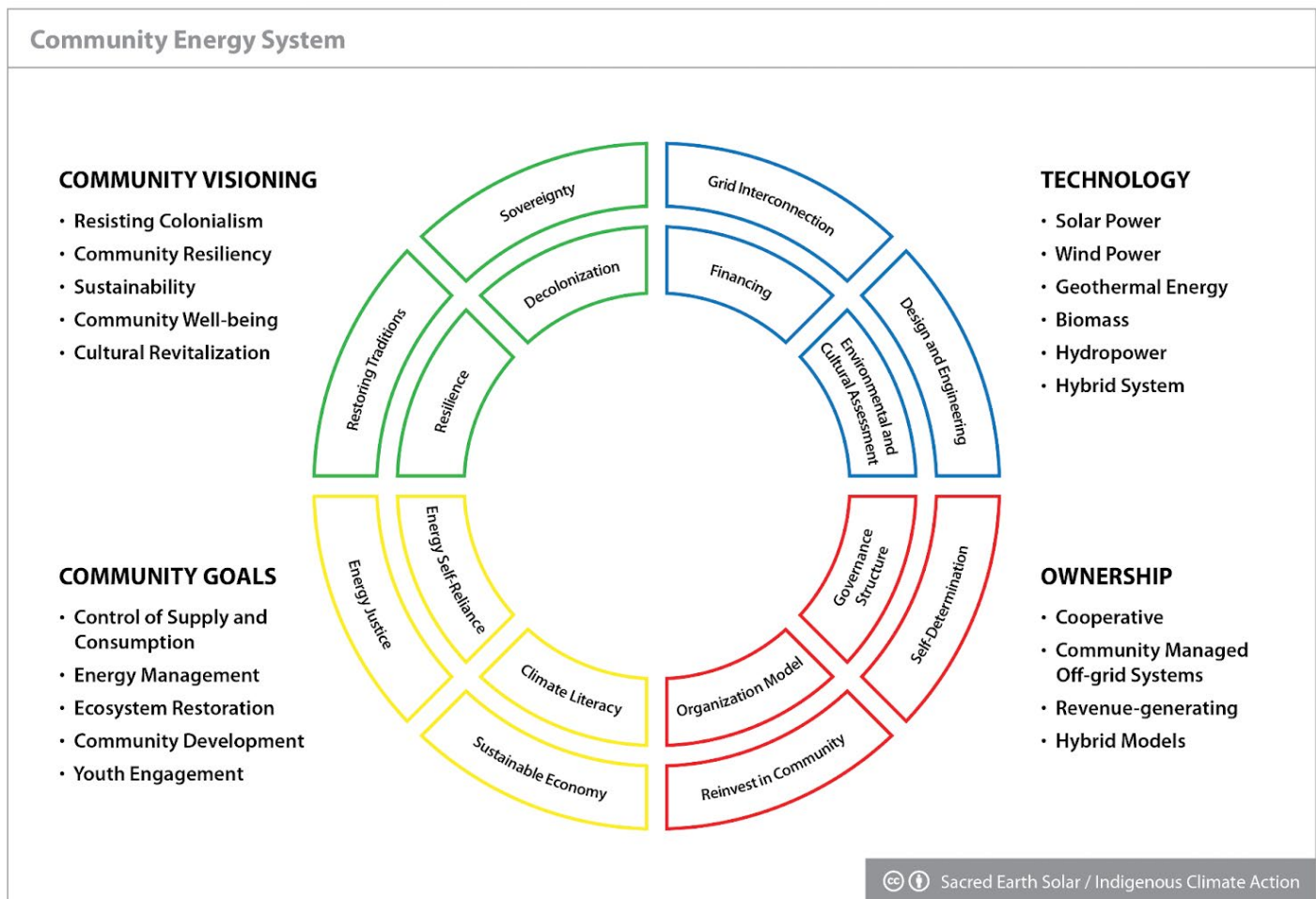
**105.** Hoicka, C.E., Savic, K., & Campney, A. (2021). Reconciliation through renewable energy? A survey of Indigenous communities, involvement, and peoples in Canada. *Energy Research & Social Science*, Volume 74, ISSN 2214-6296, <https://doi.org/10.1016/j.erss.2020.101897>.



## COMMUNITY ENERGY SYSTEMS AND DESIGNING YOUR PROJECT

Community energy systems are complex and diverse and should reflect our lifeways and standards. There are models we can draw upon to build our own clean energy projects, however, what may have worked for one community may not work for another. As you will see in the following sections, there are multiple methods and strategies for developing a clean energy system while maintaining the ultimate goal of benefiting the community.

Below is a breakdown of the objectives a community needs to consider when planning the execution of their own project. These include community end goals, visioning, ownership, and critical technology types.



**Figure 10.** Considerations for Community Energy Systems (Source: ICA/SES)



## A CASE STUDY

# RENEWABLE ENERGY PROJECT STEPS

There are many steps necessary for building a renewable energy project. Often two or more steps happen simultaneously. For example, as the project progresses, it may be necessary to seek funding sources while also searching for the best location to build the project. However, what is critical at the very beginning of a project is bringing the community together for visioning sessions which facilitate dialogue while also supporting community directives and accountability mechanisms.

Below is an example of how Melina Laboucan-Massimo worked with her community toward implementing the Lubicon Cree First Nation's solar project. Depending on the size of the project and its connection to the grid, as well as the community's specific circumstances, the order of the steps may change.

The purpose of this example is to draw you into the journey of developing an energy project from start to finish so that it may help guide you on your own energy initiatives.

More information about planning a renewable energy project can be found on the [Canadian Renewable Energy Association](#) website.<sup>106</sup>

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106. Canadian Renewable Energy Association. (2021). Life Cycle: The Life Cycle of Our Three Technologies. <https://renewablesassociation.ca/life-cycle/>.



# 3.1

## RENEWABLE ENERGY PROCESS LUBICON CREE FIRST NATION, PÎTÂPAN CASE STUDY

### SOLAR IN THE HEART OF THE TAR SANDS

The community of Little Buffalo, located in the Peace River Country of Alberta, was a thriving community nestled in the pristine boreal forest until resource extraction arrived - with a vengeance. For the past fifty years, the community has contended with devastating oil and gas spills, deforestation, air pollution, water contamination, and the notorious Alberta tar sands, right in their backyard - one of the largest and dirtiest industrial projects on Earth.<sup>107</sup> Melina Laboucan-Massimo, who is Lubicon Cree, has spent years fighting resource extraction both at home and around the globe. In 2013, two years after the community experienced the largest oil spill in Alberta's history (at the time), she decided that it was finally time to create a project which would bring hope to her community. With the help of her community, she initiated a project called Piitâpan, which means, roughly, "the coming of the dawn" in Cree.

"The project was called this to signify the coming of a new era - an era free of contamination of our homelands from oil and gas. Part of the project's intention was to raise awareness, education, and engagement about alternative energy solutions," she says.

The following steps outline the process followed by the Lubicon Cree First Nation in developing the Pîtâpan Solar Project, a 20.8 kilowatt (kW) operation featuring 80 solar panels and a "top of pole" mounted system to support power generation for the community health centre.<sup>108</sup> The following outlined steps are transferable to any renewable energy project and can be referred to as a best practice.

107. Greenfield, Nicole. (2015). 10 Threats from the Canadian Tar Sands Industry. Natural Resources Defense Council. <https://www.nrdc.org/stories/10-threats-canadian-tar-sands-industry>.

108. Sterritt, Angela. (2015). Lubicon Lake First Nation using solar to power health centre. CBC News. <https://www.cbc.ca/news/canada/edmonton/lubicon-lake-first-nation-using-solar-to-power-health-centre-1.3199688#:~:text=its%20own%20hands-,Lubicon%20Lake%20First%20Nation%20is%20setting%20up%2080%20solar%20panels,overuse%20of%20oil%20and%20gas>.



Figure 11: Little Buffalo youth taking part in solar development (photo credit: Sacred Earth Solar)

## 3.1.1 COMMUNITY VISIONING

During the summer of 2014, Melina Laboucan-Massimo traveled home to Little Buffalo to hold the first meeting on building a community solar project and the benefits of implementing a renewable energy project.

Melina observed, “Creating dialogue about energy in your community is the first step to building a project. It is important to create dialogue so that people in your community start to increase their knowledge about climate change and energy literacy. It creates space for people to start dreaming about the change they want to see. It allows for a collective vision to emerge.”

The community visioning stage is also an opportunity to hold conversations about cultural values, sovereignty, decolonization, long-term sustainability, community resilience, and revitalization.

To see a more in-depth example of how community visioning took place in T'sou-ke First Nation, check out *Building a Network of Clean Energy Systems: A Case Study of the T'sou-ke First Nation Solar Project* [here](#) (see pages 30-36).<sup>109</sup>

## 3.1.2 IDENTIFYING PROJECT LOCATION

The type of renewable energy will determine much about a project's location. With a new health building under construction at the center of the community of Little Buffalo, it was decided that the installation should be connected to this facility, particularly because this would also be located next to the community school, where students could see renewable energy at work in the day-to-day.

“A large space was needed to accommodate two rows of eighty panels - both consisting of forty solar panels, each spanning one hundred feet across. We also needed the site to be grid connected which meant it couldn't be too far from the health building, as the cabling that is required is very expensive,” says Melina.

Additionally, when digging for the underground cabling, the community had to be mindful not to hit any propane gas piping (used for heating community buildings).

Solar installations are often affixed to ground-mounted racking systems or secured on the roofs of buildings, however, “a top-of-pole” mounted system was used due to the fact that this project would be located at the center of the community. Situating the solar panels high in the air ensured that they would not be affected by any shading from the tree line, and that they would be out of the students' reach. Renewable energy projects are high voltage, so ensuring they are designed safely and installed correctly is paramount.

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<sup>109</sup> Bhattacharya, A., Bowles, P., MacPhail, F., & Gaudreau, K. (2017). Building a network of clean energy systems: A case study of the T'Sou-ke First Nation solar project. doi:10.24124/2017/58919



*Figure 12: Little Buffalo community practicing culture by smoking meat (photo credit: Power to the People, Real World Media)*

### 3.1.3

## ENVIRONMENTAL AND CULTURAL ASSESSMENT

Depending on where the community decides to build the project, an environmental scan of the area and a cultural assessment are necessary to ensure that no unforeseen issues arise.

In Little Buffalo, the project was built on a site where an old church used to be - there were old cement blocks under the ground from its foundations. As community workers and youth prepared to drill 10 holes with an auger, pour cement, and erect metal beams for the top-of-pole mount solar array, Melina spoke with Elders in the community who had a memory of the cement blocks. Their knowledge helped the team avoid the right areas while working.

Depending on the type and the scale of the project, you may be required to complete a formal Impact Assessment under provincial, territorial, and federal regulations. Impact Assessments consider the potential positive and negative environmental, health, social, and economic impacts of proposed projects.<sup>110</sup> The Impact Assessment Agency of Canada provides [more information](#).

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<sup>110</sup> Impact Assessment Agency. (2019). Impact Assessment Process Overview. Government of Canada.

<https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/impact-assessment-process-overview.html>.



## 3.1.4 INTERCONNECTION APPLICATION

As previously mentioned, the energy distributor you interact with will depend on which region your community is located in. If a community intends to connect to the electrical grid (as opposed to building an off-grid renewable energy project), then they will need to apply to their provincial energy operator.

For example, the Alberta Lubicon Cree community within Treaty 8 territory is connected to the grid, and Melina needed to submit an application through the **Alberta Utilities Commission** under the **Micro Generation Regulation**.<sup>111,112</sup> This application is for community energy projects under 5 MW of power. For large-scale revenue generating projects in Alberta, one would have to apply through the **Alberta Electric System Operator** (AESO), which manages and operates the provincial power grid in Alberta.<sup>113</sup>

## 3.1.5 DESIGN AND ENGINEERING

As the location is being decided, the next step is to work with a reputable electrical engineering firm and or a solar company that can translate the community's renewable energy vision to reality. For example, the engineering firm would assist in determining the equipment and layout (such as the direction to point the solar panels or wind turbines), as well as offer an estimate of how much energy can be produced by the project.

If the project is to be connected to the grid, there is often a process to follow depending on the province you are located in. This is known as interconnection, and happens in tandem with the design and engineering step. The time it takes to receive permission to connect to the grid can vary from weeks for small projects to years for very large projects. Do ensure that the company your community chooses to work with has a good track record when it comes to working with Indigenous communities - make time to do the necessary background reference checks. Unfortunately, there are companies operating in the renewable energy sector that do not possess the necessary skills to ensure successful projects in our communities.

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111. Alberta Utilities Commission. (N.d.). <https://www.auc.ab.ca/>

112. Alberta Utilities Commission. (2019). Micro-Generation Notice Submission Guideline. Alberta Utilities Commission. <https://www.alberta.ca/micro-generation.aspx>

113. Alberta Electric System Operator. (2021). About the AESO. Alberta Electric System Operator. <https://www.aeso.ca/aeso/about-the-aeso/>.



Figure 13: Little Buffalo Top of the Pole Solar System (photo credit: Melina Laboucan-Massimo)

## 3.1.6 FINANCING, CONSTRUCTION, AND FUNDRAISING

After gaining the support of the community and leadership, Melina began writing proposals to help fund a community solar project. The funds granted provided the seed money to begin the planning process.

“It’s important to talk about and share the aspirations for the project, as funding will often come from unforeseen allies or organizations. Develop a clear assessment of material costs, labor, and unforeseen expenses so that potential funders and supporters get a clear picture of the scope of funding required to complete the project,” says Melina.

The Pî tâpan project did not use government or corporate funding. However, your community might choose to do so. Besides writing proposals to individual funders, there are organizational and government grants, crowd-funding campaigns, and even bank loans which are increasingly available to support renewable energy in First Nations communities. For example, the British Columbia government recently created [a tool](#) to assist Indigenous communities looking for funding.<sup>114</sup>

For those interested in finding funding for your projects, go to 7.1 to see Sacred Earth Solar and Indigenous Climate Action’s [Renewable Energy Funding Database](#).

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<sup>114</sup>. Government of British Columbia. (N.d.). BC Community Climate Funding Guide. Clean BC. <https://communityclimatefunding.gov.bc.ca/indigenous-communities/>.



Even after the fundraising was complete, Melina described how implementing the system was not without its construction challenges:

*“One of the challenges with coordinating a large project was bringing solar equipment into the community. Many vendors told them that Little Buffalo was in a ‘beyond recognizable zone’ so it took time (and patience) to arrange the delivery of eighty solar panels, two separate racking systems, inverters, heavy electrical cables, and ten steel beams that weighed close to a thousand pounds each.”*

The solar equipment they used came from far and wide: Ontario, Calgary, and Kelowna. The remaining equipment was acquired by making numerous trips to and from Little Buffalo to the nearest city, Edmonton (a ten hour round trip journey), or to Peace River (a two hour drive).

### 3.1.7

## OPERATION AND MAINTENANCE

Once a project is installed and powered up, it is important to take the appropriate steps to ensure it runs smoothly and for its expected lifetime. The type of tasks and skills required vary by technology and location. For example, a run-of-the-river hydro project would require maintenance of its rotating turbines and generators, which produce electricity as water flows through them. A solar power plant, on the other hand, would require a very different type of maintenance plan to ensure the panels stay clean, undamaged, and without interference from snow or vegetation depending on the season.

Again, a vetted engineering partner and a quality construction partner should be able to advise the community on how to proceed with operations, and maintenance plans - including the costs and skills needed. As part of operations, it is common to install a monitoring system that shows the amount of energy being generated daily, along with other statistics.

Here is an example of **the monitoring system of a solar project**, typically accessed via a company app or web page.<sup>115</sup> It shows the current power being produced, and the total energy produced during the day, along with some weather information.

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<sup>115</sup>. Enphase Energy Inc. & Convergence Energy. (N.d.). River Revitalization Foundation. Enphase Energy Inc. & Convergence Energy. [https://enlighten.enphaseenergy.com/pv/public\\_systems/2NHQ1308241/overview?preview=1](https://enlighten.enphaseenergy.com/pv/public_systems/2NHQ1308241/overview?preview=1).

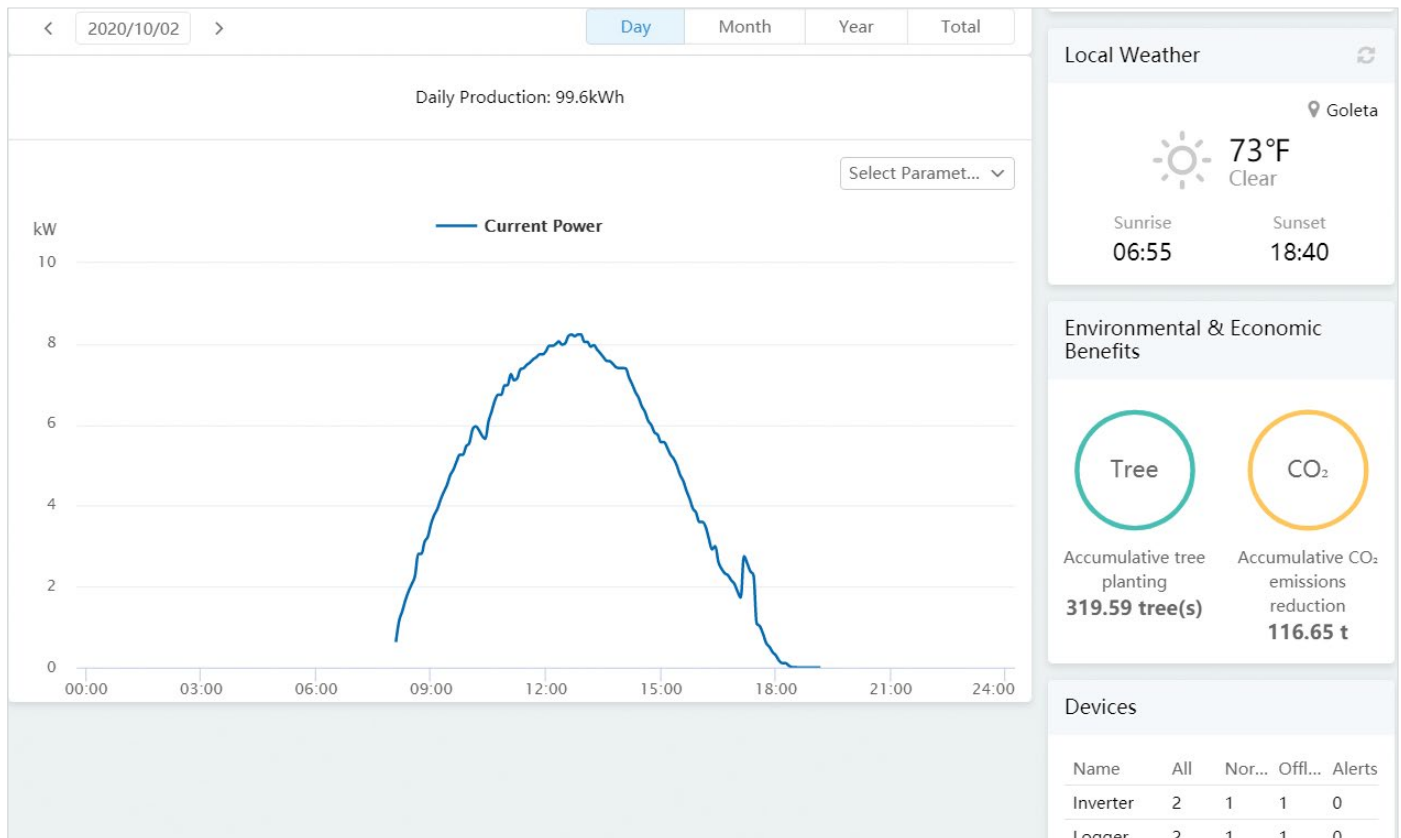


Figure 14. An example of a solar project monitoring system, indicating the power production, local weather, and environmental and economic benefits (Source: Enphase Energy Inc.)

## 3.1.8 COMMUNITY WORKSHOPS DEEPENING THE LESSONS

Engaging with your community is important to building capacity, promoting mainstream energy literacy, and generating interest in community energy projects. Melina shares:

“After a project is developed, it is important to continue these conversations in your community. This can be done in a variety of ways, including having energy literacy workshops in your community school for all ages. As well, it is essential to bring adults and Elders into the conversation. One fun way to do this is through energy and climate literacy game nights such as playing climate bingo!”



*Figure 15: Youth in Little Buffalo doing climate workshops at their school (photo credit: Melina Laboucan-Massimo)*

### 3.1.9

## OWNERSHIP MODELS AND REVENUE CREATION FOR COMMUNITIES

Identifying the right governance model for a community’s renewable energy transition is an important step in the design of an energy system. The right ownership model will depend on many factors, including the community’s vision, the goals of the project, the technology used, financing, and the project’s capacity for revenue generation. While there is no one-size-fits-all approach, the following graphic can provide guidance on the basic characteristics of different ownership models - and what to consider during the decision-making process.

As shown throughout this Guide, communities take many different approaches to ownership. While some are strategically opting to create development corporations, such as the [Six Nations of the Grand River Development Corporation](#), others are exploring cooperative models.

MODEL CHARACTERISTIC	COOPERATIVE	COMMUNITY MANAGED OFF-GRID SYSTEMS
<b>DESCRIPTION</b>	A cooperative is a business organization owned and operated by its members for their mutual benefit. Rural energy cooperatives work on the same principle that are democratically governed businesses, motivated by socially-orientated goals of local development.	Community management of energy supply systems is a service delivery model to serve isolated load centers. In such cases, a community energy committee is created to manage a mini-grid based project or other decentralized energy systems. Community can take a passive or active role
<b>OWNERSHIP</b>	Members of the cooperative (i.e. community members) own and operate the model.	Can be two models: <ul style="list-style-type: none"> <li>Owned by private/public entity and managed by communities</li> <li>Owned and managed by communities</li> </ul>
<b>MANAGEMENT</b>	Managed by a Board of directors or a governing body elected by the consumers.	Managed either by an NGO or local self-governing institutions such as community committees or community councils, etc.
<b>COMMUNITY PARTICIPATION</b>	Communities are members of Cooperatives. Local members are usually involved for O&M.	High participation. Communities are involved right from the planning stage until the end implementation stage. Several functions such as labor contribution for construction, management, maintenance, and operations are performed by communities.
<b>STRENGTHS</b>	<ul style="list-style-type: none"> <li>Lower system maintenance costs.</li> <li>Financial support can be extended to households not able to afford electricity connections.</li> <li>Increase in average revenue realization because of focused approach.</li> <li>Cooperative's intrinsic requirement to offer universal coverage to its designated area.</li> </ul>	<ul style="list-style-type: none"> <li>Decentralized management by involving communities brings in a sense of ownership and builds accountability.</li> <li>Provides employment opportunities to local members to get trained in O&amp;M of the off-grid systems.</li> <li>Communities with cohesive structures are usually able to manage the entire range of activities –power generation, O&amp;M, distribution, and accounting well if they are successfully mobilized.</li> </ul>
<b>CHALLENGES</b>	<ul style="list-style-type: none"> <li>This model is vulnerable to fall into the top-down approach.</li> <li>Cooperatives may face obstacles to remain financially sustainable.</li> <li>The legal landscape around cooperatives is still developing.</li> </ul>	<ul style="list-style-type: none"> <li>Communities may lack technical and managerial skills, and this may threaten the sustainability of the model.</li> <li>Ensuring the financial sustainability of this model can be challenging and community members should have a comprehensive plan to ensure long-term sustainability of the project.</li> </ul>

Figure 16. Examples of renewable energy project ownership models and their characteristics (Source: Shahed Shafazand)

REVENUE GENERATING MODEL	COMMUNITY MANAGED ON-GRID SYSTEMS / HYBRID MODEL
<p>In these models, a for-profit entity including equity investors or renewable energy investors may be partial owners of the energy system alongside the community. These project developers arrange an implementation model (often using one specific technology), build the energy supply, and arrange for operations and maintenance, often with the help of the community.</p>	<p>Community management of energy supply systems is a service delivery model to serve isolated load centers. In such cases, a community energy committee is created to manage a mini-grid based project that is also capable of connecting to the grid. In this model, the energy can be supplied from both the local energy system and the central grid.</p>
<p>Owned partially by the investor and the community, operated collaboratively with the community and private partners.</p>	<p>Can be two models:</p> <ul style="list-style-type: none"> <li>Owned by private/public entity and managed by communities.</li> <li>Owned and managed by communities.</li> <li>If the project is to be connected to the electric utility's company's grid, there is a specific process that needs to be followed.</li> </ul>
<p>Managed by the community. The revenue that is generated by selling back to the grid is re-invested in the community.</p>	<p>Managed either by an NGO or local self-governing institutions such as community committees or community councils, etc.</p>
<p>Depending on the development model, the community may be significantly or partially involved in the planning or management of the energy system. Acquiring the right investors and funding sources can mean revenues are reinvested back into the community for further growth.</p>	<p>High participation. Communities are involved right from the planning stage until the end implementation stage. Several functions such as labor contribution for construction, management, maintenance, and operations are performed by communities.</p>
<ul style="list-style-type: none"> <li>Revenue generating models can raise capital quicker than other models, therefore they have more opportunities to scale widely.</li> <li>Attracting investors and shareholders may lower the barriers for this model.</li> <li>Sustainable economy for the community</li> </ul>	<ul style="list-style-type: none"> <li>Decentralized management by involving communities brings in a sense of ownership and builds accountability.</li> <li>Provides employment opportunities to local members to get trained in O&amp;M of the off-grid systems.</li> <li>Communities with cohesive structures are usually able to manage the entire range of activities –power generation, O&amp;M, distribution, and accounting well if they are successfully mobilized.</li> </ul>
<ul style="list-style-type: none"> <li>If electricity is being distributed to community members for a fee, this may complicate the financial model of this energy system.</li> <li>Decentralized rural electricity is a risky investment, so few major investors other than “socially-motivated” have entered the space.</li> <li>Re-investing the revenue back into the community needs extensive planning and engagement.</li> </ul>	<ul style="list-style-type: none"> <li>Communities may lack technical and managerial skills, and this may threaten the sustainability of the model.</li> <li>Ensuring the financial sustainability of this model can be challenging and community members should have a comprehensive plan to ensure long-term sustainability of the project.</li> <li>There may be challenges to the grid extension of the local energy system.</li> </ul>

## WISDOM FROM COMMUNITIES

Below, communities speak to the social and economic benefits they have witnessed as a result of renewable energy projects and their associated ownership models:

### SIX NATIONS OF THE GRAND RIVER DEVELOPMENT CORPORATION (SNGRDC) BUILDING COMMUNITY REVENUE STREAMS

“Not only does this [solar and wind farm] create renewable energy and a green economy, but all the funds that the Six Nations of the Grand River Development Corporation (SNGRDC) make go back to benefiting our community. We’re able to invest in things like fire trucks, water line expansion, and housing developments for our people,” says Tabitha Curley, community member of the Onondaga Nation, and newly appointed member of the SNGRDC Group Advisory Committee. “A big reason for the development corporation was to create an additional source of revenue that the community can use to address funding gaps. This is a revenue stream that we can participate in and feel good about ourselves, because we know this is clean energy. We’re participating in the societal shift in how we generate energy in Canada,” she adds.

To learn more, watch [Power to the People Episode 8: Six Nations of the Grand River, ON](#). © RealWorld Media Inc.

*Figure 17: Fire Truck in Six Nations purchased by the SNGRDC Economic Development Trust Fund using renewable energy profits (photo credit: Power to the People, Real World Media)*



## GESGAPEGIAG, GESPEG AND LISTUGUJ FIRST NATIONS INVESTING IN COMMUNITY AND INFRASTRUCTURE

The Mi'gmaq communities of Gesgapegiag, Gespeg, and Listuguj worked collectively to build the [Mesgi'g Ugju's'n Wind Farm](#). According to Scott Metallic of Listuguj First Nation, "A lot of the money stays within the community. They hired 116 individuals from our three communities. I actually have a career now because of the wind farm." Thanks to money made from the wind farm which was then reinvested into the three communities, it has been possible to build a school, a water park, a playground, and a hockey rink.

To learn more, watch [Power to the People Episode 5: Listuguj, QC](#). © RealWorld Media Inc.

## TESLIN TLINGIT AND NUXALK FIRST NATIONS AN INDIGENOUS CIRCULAR ECONOMY

Implementing renewable energy projects not only retains community members and creates jobs - it helps promote a circular economy, which in turn benefits Indigenous communities by keeping the majority of money within the community. "For every dollar that we spend on biomass, 95 cents stays in this community. It's totally changing the dynamics of how we heat our homes, and the community is benefiting from those dollars," says Blair Hogan of Teslin Tlingit First Nation.

Nuxalk First Nation is also so devoted to keeping their economic gains circulating locally that they committed to only buying fixtures for their energy efficient homes within their community. "We wanted to showcase that we are able to do things here," says Jalissa Moody.

To learn more, watch [Power to the People Episode 7: Teslin, YK](#) and [Episode 9: Bella Coola, BC](#) © RealWorld Media Inc.



**Figure 18:** Community members on the Listuguj Wind Farm with Real World Media film maker (photo credit: Power to the People, Real World Media)



**Figure 19:** Community members in Bella Coola from the Nuxalk Nation working on energy efficient homes (photo credit: Power to the People, Real World Media)



## **GULL BAY FIRST NATION INVESTING IN CURRENT AND FUTURE GENERATIONS**

AJ Esquega of **Mashkawiziwin Energy Projects** echoes a sentiment commonly heard across Indigenous communities: “This [solar project] is a big thing for Gull Bay: Giizis Energy is the first sustainable influx of funds that the community can forecast and utilize to make future plans where it never could before. This is our beginning to energy and economic reconciliation; to start creating a revenue stream and build a foundation that can last for future generations.”

To learn more, watch **Power to the People Episode 13: Gull Bay, ON.** © RealWorld Media Inc.

## **TLA-O-QUI-AHT FIRST NATION TAKING CARE OF COMMUNITY**

Chief Terry Dorward observes, “By doing the run-of-the-river project, by doing geothermal, we’re looking after our people.”

To learn more, watch **Power to the People Episode 10: Tla-o-qui-aht, BC.** © RealWorld Media Inc.

### **3.1.10**

## **JOBS AND TRAINING**

Renewable energy projects can be a pathway towards energy sovereignty and supporting Indigenous peoples in achieving independence from colonial economic, energy, and governance systems. One of the ways they accomplish this is by creating alternative employment, energy systems, and opportunities for communities, which in turn leads to increased capacity building, skills development, and other social benefits. For example, in 2017 there were nearly 300,000 clean energy jobs in Canada,<sup>116</sup> yet when it comes to long term clean energy employment in Indigenous communities, there remains a gap.

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**116.** Clean Energy Canada. (2019). Missing the Bigger Picture: Tracking the Energy Revolution 2019. Clean Energy Canada.  
[https://cleanenergycanada.org/wp-content/uploads/2019/05/Report\\_TER2019\\_CleanJobs\\_20190516\\_v3\\_ForWeb\\_FINAL.pdf](https://cleanenergycanada.org/wp-content/uploads/2019/05/Report_TER2019_CleanJobs_20190516_v3_ForWeb_FINAL.pdf).



Many renewable energy projects being developed are still being driven by non-community members and without full community participation, which can curb their positive impacts. This is why a community's vision and participation throughout the development of any community renewable energy project is essential, as outlined in section 3.1.1 and the Lubicon Cree case study. Equally essential is having a full understanding of the distribution of power, and the dynamics of relationships with utilities companies. Section 6.2, Renewable Energy Challenges, explores some of the challenges you might encounter when exploring and developing your own community renewable energy project.

## WISDOM FROM COMMUNITIES

### TESLIN TLINGIT FIRST NATION REACHING ZERO UNEMPLOYMENT

Elmer Magill, a member of the Teslin Tlingit First Nation who works on their community biomass project says, “[It’s] probably the best thing that ever happened to this village! We are salvaging a renewable resource and creating employment. It’s good for the community, good for the economy. Zero unemployment. We’re part of it!”

To learn more, watch [Power to the People Episode 7: Teslin, YK](#).

### SIX NATIONS OF THE GRAND RIVER DEVELOPMENT CORPORATION (SNGRDC) CREATING EMPLOYMENT OPPORTUNITIES

In the early stages of construction for the Nanticoke Solar farm in Ontario, SNGRDC had eighteen community members working on site with the potential for up to seventy employed when the project reached full construction capacity. “[We] created an industry: new employment, new opportunities for apprentices to go on, not just here, but anywhere in the region,” says Matt Jamieson, CEO of SNGRDC.

To learn more, watch [Power to the People Episode 8: Six Nations of the Grand River, ON](#).



**Figure 20:** Gull Bay FN Community Members working on the Solar project in their community (photo credit: Power to the People, Real World Media)



## SHÍSHÁLH NATION LONG-TERM CAPACITY BUILDING

The importance of reinvesting in community members, as well as in generations to come, is a fundamental value across nations. “With this [run-of-the-river] project, we wanted our people to gain. Whether it’s rock truck driving or drilling and blasting, once they move forward with other job opportunities, they shouldn’t have as difficult of a time as their first time,” says Keith Julius, project liaison of the Narrows Inlet run-of-the-river hydro project and member of Shíshálh Nation (Sechelt).

Joni Estabrook, another member of Shíshálh First Nation, is a great example of the long-term successes that are possible when investment in community members is prioritized. Joni managed the development of the Narrows Inlet Hydro Project and has an opportunity to keep overseeing the project for the next thirty years. The skill development, job experience, and testing background involved could land her a job anywhere in Canada.

To learn more, watch [Power to the People Episode 6: Sechelt, BC](#).

## 3.2 BARRIERS TO JOINING THE GRID AND BUILDING RENEWABLE ENERGY PROJECTS

Many utility companies, along with governments intent on blocking progressive renewable energy policies, do not welcome community renewable energy partners to the grid as they challenge longstanding colonial powers and structures. Challenges that may arise while developing a renewable energy project include high capital costs; difficulty determining [Power Purchase Agreement](#) (PPA) rates; restricted grid access for Independent Power Producers; poor relationships with utility companies and business partners; and working in remote locations - to name just a few.

A Power Purchase Agreement (PPA), which typically pertains to electric utilities, is a long-term contractual agreement between energy sellers and buyers. The agreement breaks down how a pre-established amount of energy will be purchased from an electricity generation facility over a long period of time (usually 20 to 30 years), with a set escalation (or de-escalation) rate.<sup>117</sup>

An Independent Power Producer is a non-utility entity that owns an electricity generation system and sells electricity to utility companies and end-users alike. Examples include for-profit companies, First Nation Economic Development organizations, municipalities, non-profit organizations or cooperatives, or a combination of these (joint ventures).<sup>118</sup>

117. Qitoras, M. (2021). “What’s a fair and equitable price for renewable energy in remote communities?”. Pembina Institute.

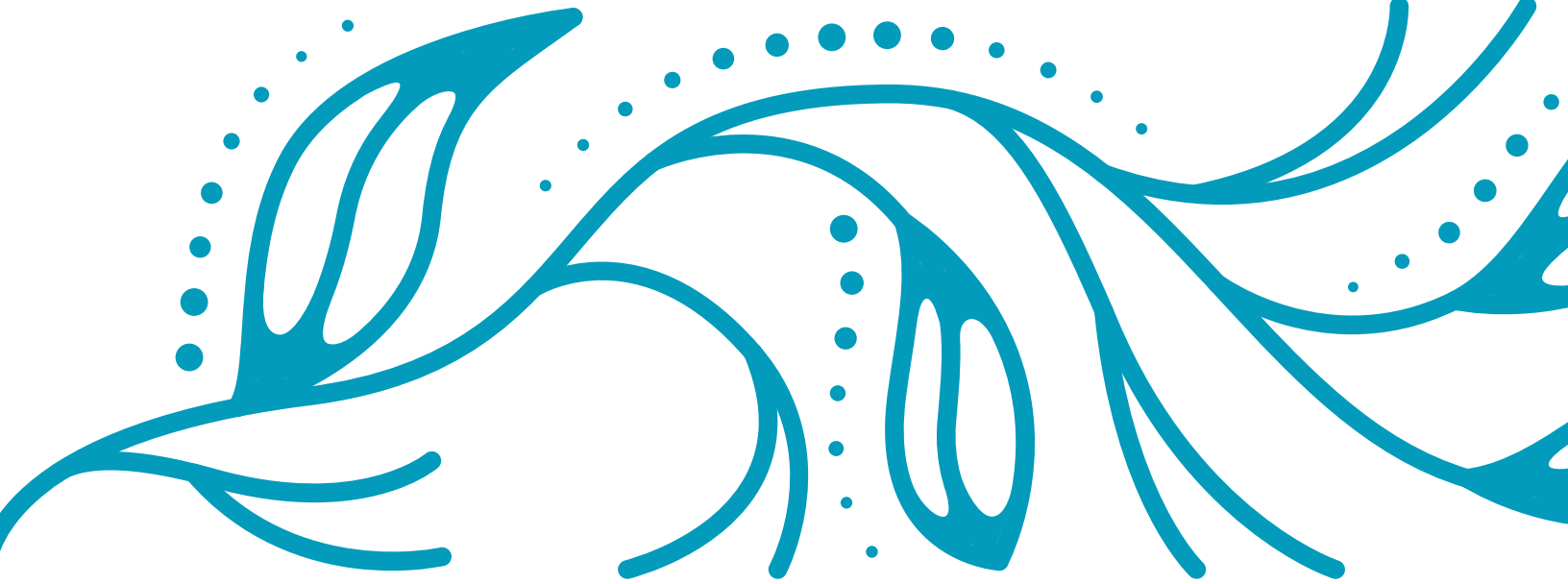
<https://www.pembina.org/blog/better-government-policies-will-unlock-cash-remote-indigenous-communities-need-clean-energy>.

118. Qitoras, M. (2021). “What’s a fair and equitable price for renewable energy in remote communities?”. Pembina Institute.

<https://www.pembina.org/blog/better-government-policies-will-unlock-cash-remote-indigenous-communities-need-clean-energy>.

Barriers to building renewable energy projects are not an accident of circumstance - they exist by design. Indigenous Peoples have been historically excluded from the design, development, and implementation of energy and economic models. As such, these models are among the many manifestations of ongoing paternalism and colonialism we see today. By empowering our communities to take control of these systems, we can move towards sovereignty and self determination. Section 6.2. outlines these barriers and challenges further.





## TYPES OF ENERGY PROJECTS THE GOOD, THE BAD, AND THE UGLY

*“We’re using the sun and the wind and the water the same way my Ancestors did - sustainably. There’s no extraction. You’re harnessing Mother Nature’s bounty without damage. And my Ancestors said, ‘If you’re going to use the land and resources, make sure there is the same or more for future generations. Those are my instructions: I cannot extract, I can only use, and I must make sure there is something for my future generations.”*

**CHIEF PATRICK MICHELL**

Kanaka Bar First Nation

David Suzuki Foundation - Charged Up Launch

In the race to address the climate crisis there is a growing exploration and development of “new” energy systems that are less greenhouse gas intensive. Indigenous communities are leaders in modeling low greenhouse gas intensive lifestyles and in welcoming a transition to “new” energy systems. However, we must be cautious in accepting new technologies and systems at face value. Many of the same corporations that have been driving the fossil industry are pushing so-called “green” projects, which are being coined as “renewable energy projects.”



This type of practice is often referred to as “greenwashing.” As previously mentioned, “Greenwashing is when a company purports to be environmentally conscious for marketing purposes but actually isn’t making any notable sustainability efforts.”<sup>120</sup> Additionally, some of these projects replicate the same old systems of harm - to the land and to our people. Nonetheless, we can’t just ignore the potential benefits some of these new technologies offer when it comes to helping achieve an equitable energy transition for our communities.

In this section we will explore the good, the bad, and the ugly of some of the so-called “renewable energy projects” currently being proposed.

In this Guide we will discuss five primary sources of renewable energy: solar, geothermal, wind, hydroelectric, and biomass. We will also discuss the complexities and dangers of using nuclear energy as a transition fuel.

## “RENEWABLE” ENERGY

Sources of renewable energy are continually replenished by the Earth’s natural systems and are not finite or exhaustible like fossil fuels.<sup>121</sup> Renewable energy systems are intrinsically connected to the Earth’s natural cycles and systems. **Solar energy** requires the heat and energy of the sun. Hydropower comes from the movement of water, which is dependent on the Earth’s hydrological cycle. **Wind power** comes from wind currents caused by complex weather systems and atmospheric pressure differentials. **Geothermal energy** is the thermal energy stored deep within the Earth as water and steam. **Biomass** is the organic material of plants, and represents the stored chemical energy of the sun, which has been converted through photosynthesis.

Despite the potential of these energy sources to be renewable, the size and scale of a project can make it unsustainable - large-scale biomass production and megadams, for instance.

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120. Edwards, Carlyann. (2023). What is Greenwashing?. Business News Daily.

<https://www.businessnewsdaily.com/10946-greenwashing.html>

121. Natural Resources Canada. (N.d.). About Renewable Energy. Government of Canada.

<https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy/7295>.



Figure 21: Top of the Pole Solar System in Little Buffalo (photo credit: Melina Laboucan-Massimo)

## 4.1

# SUN: SOLAR PHOTOVOLTAIC AND SOLAR THERMAL SYSTEMS

*“More power from the sun hits the earth in a single hour than humanity uses in an entire year.”<sup>122</sup>*

**NATIONAL RENEWABLE ENERGY LABORATORY**

## WHAT IS SOLAR ENERGY?

Our movement around the Sun is responsible for creating what we know as “day” and “night.” It allows plants to grow, and makes all life on Earth possible. It is not only our most abundant renewable resource, but it is life itself.

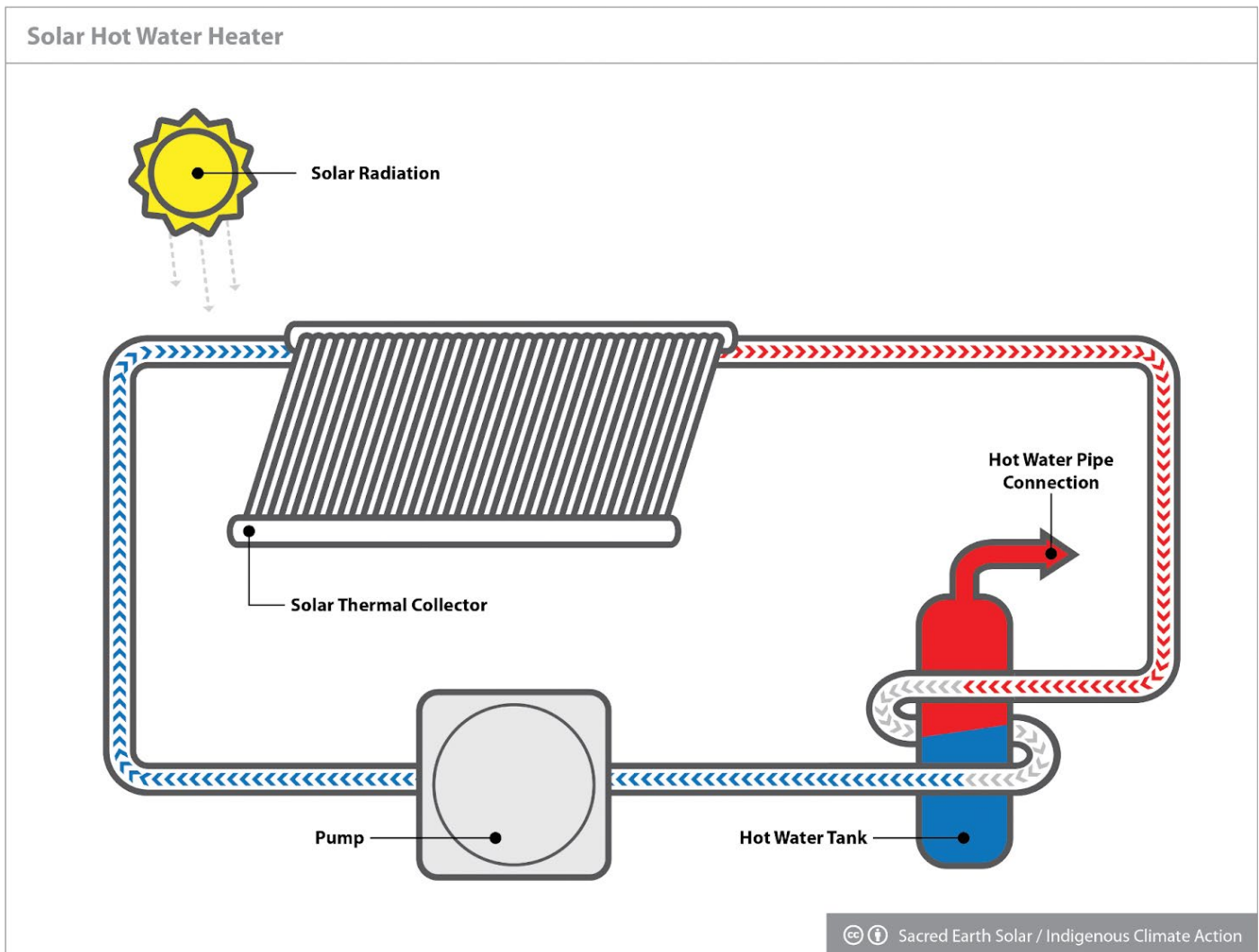
Solar energy has been long explored and proposed as one of the most critical renewable and low GHG energy systems that can be utilized in our energy transition. But as technology continues to advance in this field, we must ensure that we are choosing options that minimize emissions, costs, and harm to our lands and our peoples. Not every option is viable in every community. Therefore it’s necessary for us to understand how these technologies work, how they can benefit us on our path to a Just Transition, and where they might not work for us.

There are two main ways to generate solar energy for human activity: the conversion of the sun’s energy to electricity via solar photovoltaic (PV) systems; and the conversion of the sun’s energy for the purpose of heating water via solar thermal systems. PV systems contain a PV cell, a semiconductor device that generates direct-current (DC) electricity by converting the energy of the sun. PV systems are classified into two major categories - “off-grid” or “grid-connected.” Solar heating and cooling technologies use the sun’s thermal energy to supply hot water, space heating, and cooling for residential, commercial, and industrial applications.<sup>123</sup>

For a tour of a Silfab Solar manufacturing facility, watch [Power to the People Episode 8: Six Nations of the Grand River, ON](#).

Please refer to section 4.8, Renewable Energy Considerations, to learn more about the impacts of lithium mining required for batteries in offgrid systems.

The following images show how solar thermal energy works - and how it looks on a rooftop:



**Figure 22.** Solar thermal energy, illustrated by a solar hot water heater diagram (Source: ICA/SES)

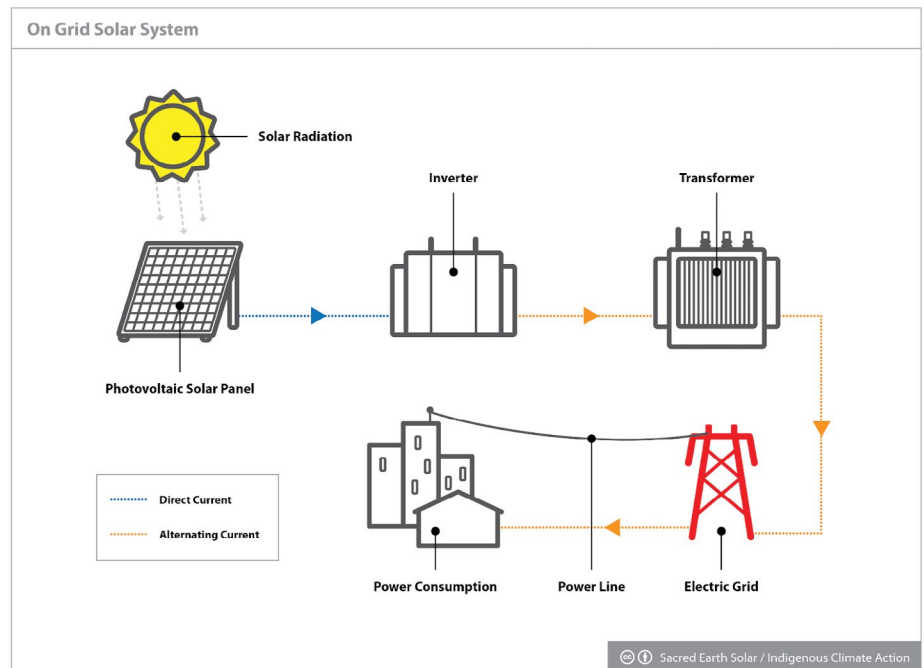
123. Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. Renewable & Sustainable Energy Reviews, 39,748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.



Most solar panels or **photovoltaic modules** in operation today are composed of **solar cells** that generate electrical power. “Photovoltaic installations may be ground-mounted, rooftop mounted, wall mounted or floating. The mount may be fixed or use a solar tracker to follow the sun across the sky.”<sup>124</sup> Once installed, its operation generates no pollution and no greenhouse gas emissions. However, we will discuss the sustainability considerations of solar panel production below.

The following steps and corresponding image demonstrate how a grid-connected solar photovoltaic system usually functions.

1. Sunlight reaches the solar modules (photovoltaic solar panels).
2. The solar module converts the light particles into an electric current.
3. Before connecting to the electric grid, an inverter is used to convert the energy from a direct current (DC) to an alternating current (AC) - the same form as that of the electric grid.
4. Voltage and current can both be adjusted with a transformer to allow for a safer and more reliable transfer over long distances before being readjusted to the correct levels for household or industrial use.<sup>125</sup>



**Figure 23.** An on-grid solar system (Source: SES/ICA)

125. Office of Energy Efficiency & Renewable Energy. (N.d.). How Does Solar Work?. US Department of Energy. <https://www.energy.gov/eere/solar/how-does-solar-work>



Once a solar panel system is installed, not only can it significantly reduce energy costs - but with enough sun exposure, it can add electricity to the utility company's grid. This can be seen in the bi-directional meter as it spins backwards - the meter works by measuring energy in two directions: how much energy you consume from the grid, and how much excess energy you export back to the grid.

Typically, a Power Purchase Agreement (PPA) is signed, entitling smaller producers to receive payment from the utility company for the solar energy being produced. "PPAs are financial agreements between an energy buyer and a renewable energy project developer. In these long-term contracts, the buyer guarantees the developer a fixed price for energy from a project that hasn't been built yet, such as a wind farm or a solar array."<sup>126</sup>

Another model for dealing with excess energy is to establish a local solar cooperative, where cooperative members receive credits on their utility bills for their share of excess energy each month.

If the world is successful in transitioning to renewable energy, the decentralization of power will benefit countless communities in countless ways.

Many communities and individual dwellings channel solar power only for their own usage. In other words, these systems are not connected to the electric grid and are therefore called 'off-grid' systems. In this situation, the energy from the solar system flows to a battery bank. From the batteries, the electricity is converted to alternating current (AC) via an inverter if needed, and then supplied to the **load** or building. Using a battery bank instead of connecting the energy source directly to the load provides a smoother flow of energy with fewer disruptions. Sometimes, a diesel or gasoline generator is also used in parallel with the renewable energy system in case the battery's capacity is unable to meet the needs of the load. This can happen if there is inadequate weather for several days and the batteries are drained.

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<sup>125</sup>. Bullfrog Power. (N.d.). Power Purchase Agreements. Bullfrog Power.  
<https://bullfrogpower.com/sustainability-solutions/power-purchase-agreements/>.



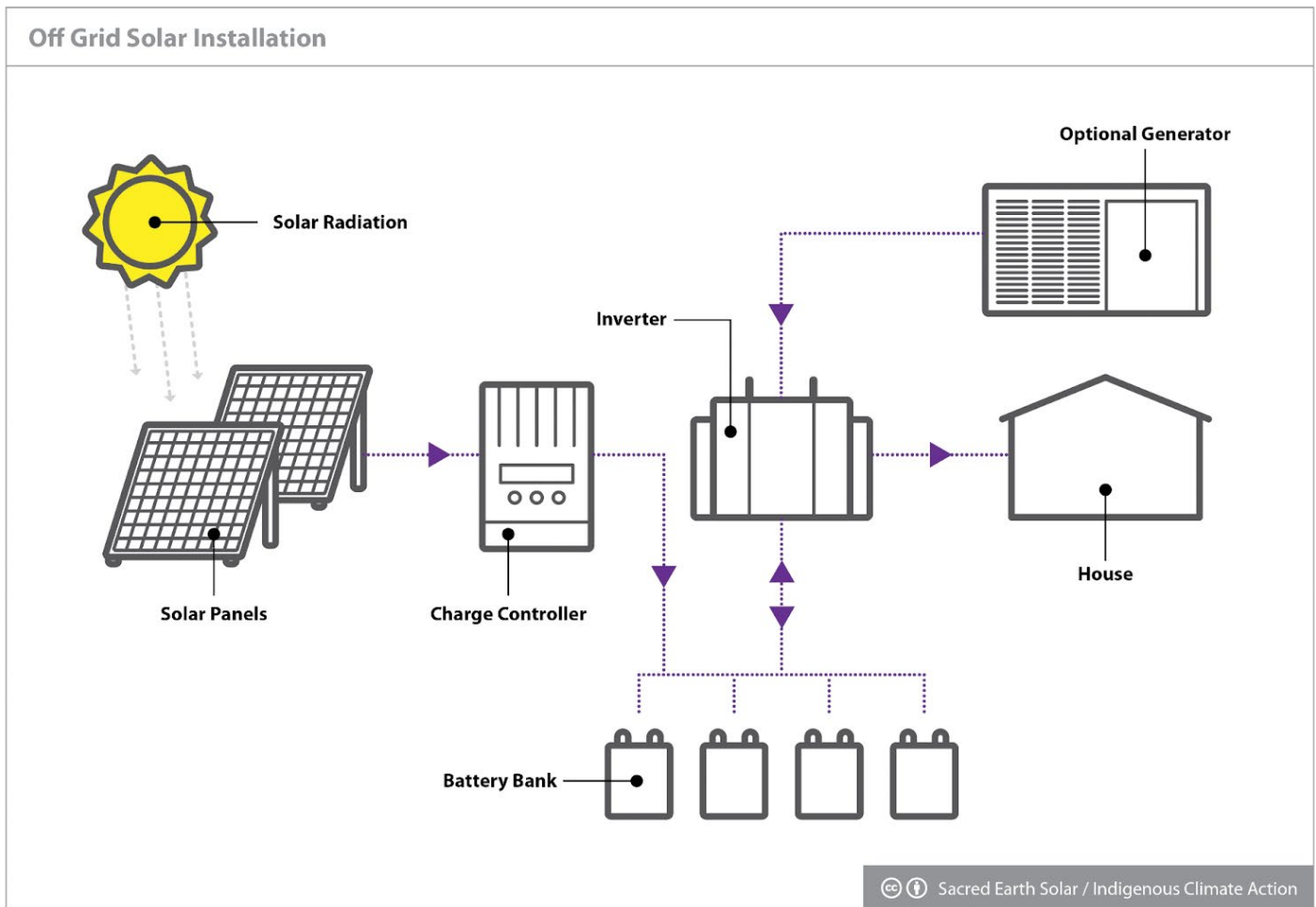


Figure 24. An off-grid solar system diagram (Source: SES/ICA)

## SOLAR ENERGY SUSTAINABILITY CONSIDERATIONS

It's important to reflect upon extractive methods of drawing resources from the land, as the materials needed for solar energy still require taking from Mother Earth on a large scale that does not align with the Indigenous practices of balance and reciprocity. For starters, large-scale production leads to the loss of access to sacred territories and can compromise the resurgence of traditions.

As well, there is a disconnect: materials come from an external place - often times from other countries which feel the socio-economic impacts of extractive economies on their lands too.

The production of photovoltaic devices necessitates a variety of extractive and mining practices to produce chemicals and other materials - which can then be released into the air, surface water, and groundwater at the manufacturing facility, the installation and decommissioning site, and the disposal or recycling facility alike.<sup>127</sup> The production of solar energy storage devices may also cause indirect

127. Klugmann-Radziemska, Ewa. (2014). Environmental impacts of renewable energy technologies. In International Conference on Environmental Science and Technology. IPCBEE, Singapore, pp. 104-109.

pollution.<sup>128</sup> Depending on the scale of the project, solar panel systems may degrade large areas of land and cause habitat loss.<sup>129,130</sup> It is also important to consider that offgrid systems require the use of lithium batteries, which also impact land and communities.

According to Ramón Morales Balcázar, member of the Observatorio Plurinacional de Salares Andinos - a plurinational network of Indigenous Peoples, peasants, academics, and nongovernmental organizations in Latin America's Lithium Triangle:

“None of the ongoing or new lithium projects in Chile have been through consultation or proper environmental assessment. Lithium companies refuse to acknowledge that brine is water and don't understand the real value of Andean Salt flats and wetlands as complex socio-ecosystems. Behind Chilean lithium there's also corruption at all levels. The situation in Argentina is very similar. This is what extractivism means and as long as this doesn't change there's no way we can obtain sustainable lithium in the so-called Lithium Triangle.”

The production of solar panels can have a detrimental ecological impact on our close relatives, from the loss of traditional and hunting grounds, to the poisoning of our sacred water, to the disruption of ceremonial traditions at the heart of our reciprocal relationships and our balance with the natural world. These impacts extend far beyond communities within so-called Canada. These impacts are often experienced most deeply by racialized and marginalized communities on the frontlines of extractivism in other countries. Understanding where the materials for energy systems come from is just as important as reducing GHG emissions. We need to start thinking seriously about what sustainable production in the renewable energy field should look like. Please refer to Section 4.8 on Renewable Energy Considerations for more information.

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**128.** Abbasi, S. A., and Abbasi, Naseema. (2000). “The Likely Adverse Environmental Impacts of Renewable Energy Sources.” *Applied Energy* 65, (1): 121–44. [https://doi.org/10.1016/S0306-2619\(99\)00077-X](https://doi.org/10.1016/S0306-2619(99)00077-X).

**129.** Ibid.

**130.** Hung, Christine. (2010). “Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results.” Institutt for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHjZdg>





## WISDOM FROM COMMUNITIES

The stories that follow highlight how Indigenous communities have successfully transitioned from fossil fuel production to solar.

### MONTANA FIRST NATION FROM DIESEL TO SOLAR SUCCESS

“We were once a really rich oil and gas nation and over the years oil and gas has gone down. No more resources were coming out of those wells, so we had to make some hard changes. Five years ago, we had to release 50% of our staff at the nation,” says Vickie Wetchie, General Manager of Green Arrow Corporation and member of Montana First Nation.<sup>131</sup>

Southern Alberta has some of the highest solar exposure in Canada. Montana First Nation, facing a waning supply of oil, realized they could start utilizing solar energy to power their Nation. So they worked with a company to install a 100 kW solar system, which, in turn, reduced their energy bills by 60%. Following the success of that **pilot project**, they founded Green Arrow Corp. Akamihk, a community-owned and operated solar energy company. Since 2012, Green Arrow has trained 48 people in solar and energy efficiency and installed projects across Alberta.<sup>132</sup>

*“Just seeing the kids that come in through the different programming and say ‘my Dad is a solar guy. That’s what I want to do when I grow up. I want to be able to put those panels on.’ It has increased the pride in our community.”<sup>133</sup>*

#### VICKIE WETCHIE

Montana First Nation  
General Manager, Green Arrow Corporation

131. Office of Energy Efficiency & Renewable Energy. (N.d.). How Does Solar Work?. US Department of Energy.  
<https://www.energy.gov/eere/solar/how-does-solar-work>

132. Ibid.

133. Ibid.



*Figure 25: SNGRDC's Nanticoke Solar Project (photo credit: Power to the People, Real World Media)*

## **SIX NATIONS OF THE GRAND RIVER DEVELOPMENT CORPORATION (SNGRDC) AND THE MISSISSAUGAS OF THE CREDIT FIRST NATION COMMUNITY SOLAR COLLABORATION**

The first solar energy project created by SNGRDC in partnership with Samsung C&T was the Grand Renewable Solar Farm: a 100 MW solar farm powered by 447,000 solar panels, producing enough energy to power approximately 17,000 homes; the project's GHG reduction is equivalent to taking 29,000 cars off of the road and, at the time of its construction, it was the largest solar project in Canada.

SNGRDC also collaborated on a joint venture with Ontario Power Generation to develop a 44 MW solar farm on the former site of the Nanticoke coal plant. The new **260-acre Nanticoke Solar farm** has 192,431 solar panels, 23 inverters, 16 transformers, and kilometres of above- and below-ground power cabling.

"We've partnered with the SNGRDC and the Mississaugas of the Credit First Nation, on this important initiative," says Ontario Power Generation's Mike Martelli, President of Renewable Generation. "Building and sustaining a clean, low cost electricity system is fundamental to a healthy environment and a strong, low-carbon economy."<sup>134</sup>

SNGRDC also worked with the municipality of Brant to transform the Oneida Business Park from an economically idle building into a profitable 500 kW / 2,307 solar paneled rooftop. The addition of a rooftop solar installation made the 20-year-old building profitable for the first time in over a decade.

"I'm pretty proud: the majority of this project was constructed by our own community members," says Matt Jamieson, CEO of SNGRDC.

To learn more, watch **Power to the People Episode 8: Six Nations of the Grand River, ON.**

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<sup>134</sup>. Ontario Power Generation. (2020). At former coal generating site, Nanticoke Solar hits milestone in fighting climate change. <https://www.opg.com/story/at-former-coal-generating-site-nanticoke-solar-hits-milestone-in-fighting-climate-change/>



## NAVAJO NATION EXAMPLES FROM SOUTH OF THE MEDICINE LINE (THE SO-CALLED UNITED STATES OF AMERICA)

In Arizona, the **Navajo Tribal Utility Authority** provides a range of energy services to their community members in order to address the lack of utilities provided to their Nation. The Navajo Nation's territory was previously home to both the Navajo Generating Station and the Four Corners Power Plant. All profits and control were outside of their hands and the Nation's benefits were limited to lease payments, coal royalties, and employment - many argue that these benefits were outweighed by negative health impacts, pollution, and the Nation's continued lack of access to electricity. But today, the Nation owns and operates two solar PV plants with a combined capacity of 55 MW. Furthermore, a 70 MW project for the Utah Navajo is under development, and is expected to be completed in 2023.<sup>141</sup>



**Figure 26:** Listuguj Wind Farm  
(photo credit: Power to the People, Real World Media)

## 4.2

## WIND: ONSHORE AND OFFSHORE WIND TURBINES

### WHAT IS WIND POWER?

Many Indigenous Peoples across Turtle Island tell stories about the majestic power of the wind. Windmills have been used all around the world for thousands of years to generate energy, draw up water, and mill grain.<sup>142,143</sup> Currently there are 301 wind farms in operation in so-called Canada, with an installed capacity of 13,413 MW.<sup>144</sup>

Similar to solar, wind power has become a very promising option for energy transitions, especially for communities in high wind corridors. However, like solar, there continue to be concerns and questions. The key is ensuring that we are fully aware of how the technologies work and how they can support our goals. It is critical that we understand how to attain ownership, maintain operations, and act as the primary drivers of Indigenous-led projects. While wind technologies appear

<sup>141</sup>. Navajo Tribal Utility Authority. (N.d.). Red Mesa Tapaha Solar Farm. <https://www.ntuasolar.com/red-mesa-tapaha>

<sup>142</sup>. Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. 2014. Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. *Renewable & Sustainable Energy Reviews*, 39,748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

<sup>143</sup>. U.S. Energy Information Administration. (2021). Wind Explained - History of wind power. <https://www.eia.gov/energyexplained/wind/history-of-wind-power.php#:~:text=People%20have%20been%20using%20wind%20energy%20for%20thousands%20of%20years&text=By%20the%202011th%20century%2C%20people,windmills%20extensively%20for%20food%20production>.

<sup>144</sup>. Canadian Wind Energy Association. (N.d.). Why Wind Works. <https://canwea.ca/wind-facts/why-wind-works/>.

to have limited impacts, they may not work for every community.

Wind power is the conversion of wind energy by turbines - into electricity, mechanical power, or other useful forms of energy. This is how modern-day turbines generate electricity:

1. The kinetic energy of moving air (wind) spins propeller-like blades around a rotor.<sup>145</sup>
2. The rotor connects to a generator, either directly (for direct drive turbines) or via a shaft and a series of gears (a gearbox).<sup>146</sup>
3. Through the conversion of aerodynamic force to the rotation of a generator, electricity is generated.<sup>147</sup>
4. When grid-connected, the electricity then passes through a substation and power lines to provide electricity to homes and businesses.<sup>148</sup>

Today, over 314,000 wind turbines supply nearly 4% of global electricity, however the proliferation of turbines, decreasing costs, and heightened performance will soon lead to more widespread adoption of wind energy. Wind farms also provide a fast return on investment due to their relatively fast construction time of one year or less.<sup>149</sup>

## ONSHORE WIND TURBINES

Onshore wind turbines generate fuel-free, non-polluting electricity at a utility scale comparable to power plants. Onshore wind farms have small footprints and typically use no more than 1% of the land they sit on - allowing grazing, farming, recreation, or conservation to happen simultaneously with power generation.<sup>150</sup>

## OFFSHORE WIND TURBINES

Although wind is a variable source of energy, the winds over sea are more consistent than those over land. Offshore wind turbines harness that extra power to generate utility-scale electricity - free of fuel inputs or greenhouse gas emissions.<sup>151</sup>

## WIND TURBINE SIZE CONSIDERATIONS

The size of the wind turbine your community needs depends on the electricity application and demand. Large-scale, commercial wind projects are possible when Nations work together to create renewable energy solutions, though it is unlikely that such large wind turbines will be the right solution for every Nation. Depending on the amount of electricity you want to generate, the smaller turbines used in residential applications can produce up to 100 kW, which is more affordable and practical for many small communities.<sup>152</sup>

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<sup>145</sup>. Office of Energy Efficiency & Renewable Energy. (N.d.). How Do Wind Turbines Work?. U.S. Department of Energy. <https://www.energy.gov/eere/wind/how-do-wind-turbines-work>.

<sup>146</sup>. Ibid.

<sup>147</sup>. Ibid.

<sup>148</sup>. Owen, Michael. (2023). How Does Electricity Move From the Wind Turbine to the Businesses and Communities That Buy It?. Sciencing. <https://sciencing.com/electricity-move-wind-turbine-businesses-communities-buy-it-21904.html>.

<sup>149</sup>. Project Drawdown. (2020). Onshore Wind Turbines. <https://drawdown.org/solutions/onshore-wind-turbines>.

<sup>150</sup>. Ibid.

<sup>151</sup>. Project Drawdown. (2020). Offshore Wind Turbines. <https://drawdown.org/solutions/offshore-wind-turbines>

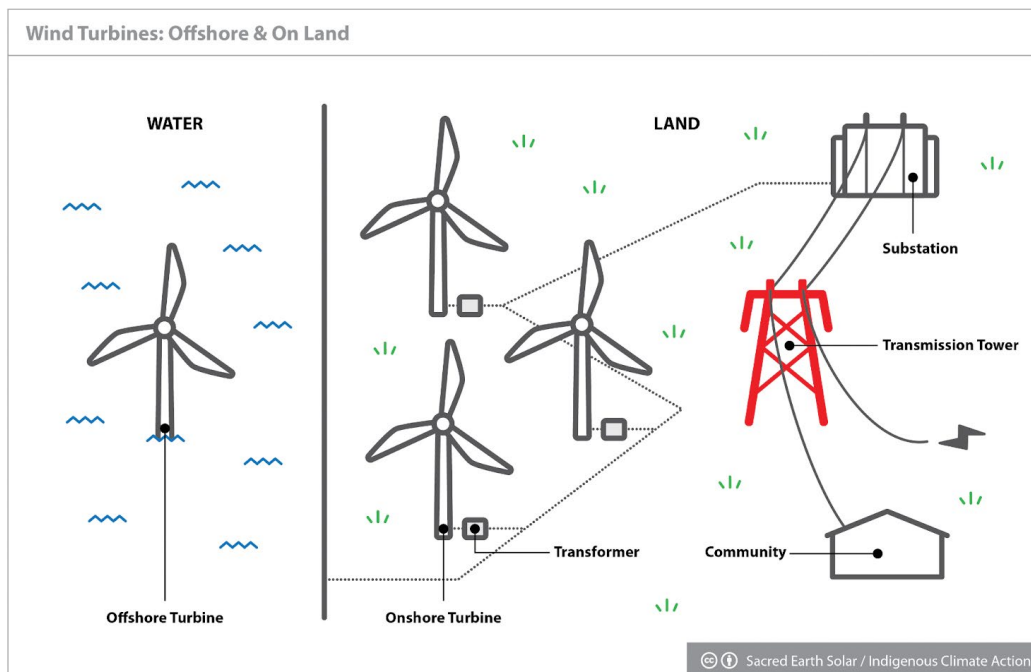
<sup>152</sup>. U.S. Department of Energy. (N.d.). Small Wind Guidebook. <https://windexchange.energy.gov/small-wind-guidebook#size>.



**Figure 27:** SNGRDC Wind Turbine (photo credit: Power to the People, Real World Media)

When weighing project size with the need to keep our cultural values and norms at the heart of our energy production, the principle of ‘taking only what you need’ is key. While it might be tempting to build renewable energy projects that extend beyond the needs of our communities, we need to be cautious not to promote participation in large, predatory economies that harm others - including Mother Earth.

According to Matthew Wadham-Gagnon of **Nergica**, “One of the reasons that we have smaller turbines is that a lot of remote communities don’t have 500 households or 1000 households, so as soon as you have a few of these large wind turbines installed, you’re over capacity.”



**Figure 28.** Components of a wind turbine system (Source: SES/ICA)



## WIND ENERGY SUSTAINABILITY CONSIDERATIONS

Although modern wind turbine designs produce less noise and reduce hazards to birds, they can still cause noise pollution, create “shadow flicker” on nearby homes (when sun passes behind the turbine), and cause indirect and direct hazards for birds, bats, and other avian species.<sup>153,154,155</sup> However, these issues can be minimized or avoided by placing the turbines strategically - an appropriate distance away from homes and migration routes alike.<sup>156,157</sup> It’s also worth considering that the materials used to build turbines, such as cement, concrete, steel and aluminum have impacts associated with the mining of metal and minerals.<sup>158</sup>

## WISDOM FROM COMMUNITIES

### GESGAPEGIAG, GESPEG, AND LISTUGUJ BUILDING A COLLECTIVE WIND FARM

Three Mi’gmaq communities of Gesgapegiag, Gespeg and Listuguj worked collectively to build the **Mesgi’g Ugju’s’n Wind Farm**. The farm consists of 47 wind turbines with a total installed capacity of 150 MW.<sup>159</sup> It generates enough electricity to power approximately 30,000 households.<sup>160</sup> This project helps to power their communities, create jobs, and generate significant revenue for their people.

“We chose it because we’re in the Saudi Arabia of wind. The most amount of turbines in Quebec are located in Gaspé,” says Terri-Lynn Morrison, Mi’Gmawei Secretariat for Listuguj. At the time of



*Figure 29. A Mi’gmaq child learns first-hand how a wind turbine functions (photo credit: Power to the People, Real World Media)*

153. Klugmann-Radziemska, Ewa. (2014). Environmental impacts of renewable energy technologies. International Conference on Environmental Science and Technology. IPCBEE, Singapore: 104-109.

154. Sayed, Enas Taha, Tabbi Wilberforce, Khaled Elsaid, Malek Kamal Hussien Rabaia, Mohammad Ali Abdelkareem, Kyu-Jung Chae, and A. G. Olabi. (2021). “A Critical Review on Environmental Impacts of Renewable Energy Systems and Mitigation Strategies: Wind, Hydro, Biomass and Geothermal.” *The Science of the Total Environment*. 766: 144505–144505. <https://doi.org/10.1016/j.scitotenv.2020.144505>.

155. Hung, Christine. (2010). “Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results.” Institut for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHjZdg>.

156. Klugmann-Radziemska, Ewa. (2014). Environmental impacts of renewable energy technologies. International Conference on Environmental Science and Technology. IPCBEE, Singapore: 104-109.

157. Sayed, Enas Taha, Tabbi Wilberforce, Khaled Elsaid, Malek Kamal Hussien Rabaia, Mohammad Ali Abdelkareem, Kyu-Jung Chae, and A. G. Olabi. (2021). “A Critical Review on Environmental Impacts of Renewable Energy Systems and Mitigation Strategies: Wind, Hydro, Biomass and Geothermal.” *The Science of the Total Environment*. 766: 144505–144505. <https://doi.org/10.1016/j.scitotenv.2020.144505>.

158. Hung, Christine. (2010). “Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results.” Institut for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHjZdg>.

159. Mesgi’g Ugju’s’n. (2016). Mesgi’g Ugju’s’n - a Wind Farm in Partnership with the Mi’gmaq Communities of Quebec. <http://www.muwindfarm.com>.

160. Ibid



**Figure 30.** Mesgi'g Ugju's'n Wind Farm (Source: Power to the People, Real World Media)

conception, there were 1600 MW worth of wind projects in their territory, and instead of going to each company and negotiating for royalties, they decided to create their own wind project.

“The wind is ours. The wind comes from the territory. The territory is ours. So if you can recognize that, you can come and have a discussion with us,” says Troy Jerome, CEO of Sen'ti Environmental. But the road to securing funding and support from the Quebec government was not without obstacles - Troy speaks to the difficulty of discussing treaty rights, noting that, “The government at the time was very dismissive.”

Mi'gmaq First Nations in Nova Scotia, dealing with similar colonial antics, set a helpful precedent by taking the government all the way to the Supreme Court in an effort to protect their treaty rights to fish - and they won. This jurisdictional precedent encouraged the three Mi'gmaq communities of Gesgapegiag, Gespeg and Listuguj to approach the Quebec Government for project funding. Quebec urged them to create a smaller scale wind project, but knowing that their territory (surrounded by water and high mountains) had incredible wind potential, they stuck to their vision and secured one million dollars in funding to train their people.

Each turbine on the Mesgi'g Ugju's'n Wind Farm is one hundred meters high and requires between three and four meters per second of wind to spin the blades (at 10-15 km per hour). When at full power capacity, each turbine spins at 80 km per hour and generates 4.1 MW of electricity - enough to power 500 homes each.

Gesgapegiag, Gespeg and Listuguj now receive half of the profits from the project, equal to 234 million dollars over a twenty year period, or roughly ten million dollars a year in revenue for their respective communities.

To learn more about this amazing 47 turbine wind farm, watch [Power to the People Episode 5: Listuguj, QC](#).



**Figure 31:** Kluane FN community member learning about wind energy (photo credit: Power to the People, Real World Media)

## **KLUANE FIRST NATION HARNESSING AVAILABLE FUNDING IN BUILDING RENEWABLE ENERGY**

Kluane First Nation, located in the Yukon, is in the process of installing three 100 kW turbines, set to produce 570,000 kW hours for the community each year, replacing about 160,000 liters of diesel annually.

The community was able to secure \$2 million in funding through the “Investing in Canada” infrastructure plan (initiated by Clean Energy for Rural and Remote Communities, a division of Natural Resources Canada), and an additional \$1.1 million from the Northern REACHE Program. They received an additional \$1.1 million from Crown-Indigenous Relations and Northern Affairs Canada’s Northern REACHE Program. These two **programs** aim to invest in projects that are focused on reducing reliance on fossil fuels in Canada’s rural, remote and Indigenous communities.<sup>161</sup>

To learn more, watch **Power to the People Episode 12: Kluane, YK.**

## **SIX NATIONS OF THE GRAND RIVER DEVELOPMENT CORPORATION (SNGRDC) BUILDING WITH ENERGY PARTNERS**

The first renewable energy project of the SNGRDC was the Niagara Region Wind Farm, a 230 MW wind facility which produces enough energy to power 76,000 homes. SNGRDC owns 50% of the project, which they share with renewable energy building partner Boralex.

To learn more, watch **Power to the People Episode 8: Six Nations of the Grand River, ON.**

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<sup>161</sup>. Association of Power Producers of Ontario. (N.d). Yukon’s Kluane First Nation to build 300 kW of wind power.  
<https://magazine.appro.org/news/national-news/6078-1572312699-yukon%E2%80%99s-kluane-first-nation-to-build-300-kw-of-wind-power.html>



## **KWIGILLINGOK, KONGIGANAK, TUNTUTULIAK AND KIPNUK AN INNOVATIVE MINI GRID PROJECT**

Near the Bering Sea, in the Kuskokwim region of Alaska, sit the communities of Kwigillingok, Kongiganak, Tuntutuliak, and Kipnuk. In 2005, their combined population of about 2000 tribal members banded together to form the Chaninik Wind Group. This pioneering mini grid project combined nearly 1500 kW of wind power with smart meters, electric thermal stoves, battery backup, and a smart control system. The community has since seen a 30% reduction in diesel use as a result of this system. In the process, they have demonstrated that through cooperation and persistence, meaningful results can be achieved.

### **4.3**

## **WATER: RUN-OF-THE-RIVER AND MICRO-HYDROPOWER SYSTEMS**

### **WHAT IS HYDROPOWER?**

Energy derived from water, or hydropower, is created when turbines convert moving water into electricity. This section will focus primarily on run-of-the-river and micro-hydro, as we do not consider megadams a sustainable use of hydropower - they have long been detrimental to Indigenous homelands. Finally, although tidal energy is not widely used on Turtle Island yet, it can provide a way of converting the kinetic energy of ocean tides into usable energy.

Water security is important, not only for generating energy and electricity - water is the most critical resource for the survival of all beings, and thus sustainable access to it is essential. And since run-of-the-river projects draw energy from the available flow of a river, reliable power generation is reliant on water security.<sup>166</sup> But the fact is, water security remains an issue for many remote Indigenous communities - in many cases they do not have reliable access to an acceptable quantity and quality of water.<sup>167</sup> To sustain both our energy and our basic human needs, a sustainable relationship with water is crucial.

<sup>166</sup>. Ibid

<sup>167</sup>. APTN National News. (2021). Overworked, underpaid: Ottawa's chronic lack of funding leaves First Nations water operators behind. <https://www.aptnnews.ca/national-news/first-nations-water-operators-federal-government/#:~:text=Clean%20Water%2C%20Broken%20Promises%20is,series%20over%20the%20coming%20weeks>.

## RUN-OF-THE-RIVER AND MICRO-HYDROPOWER

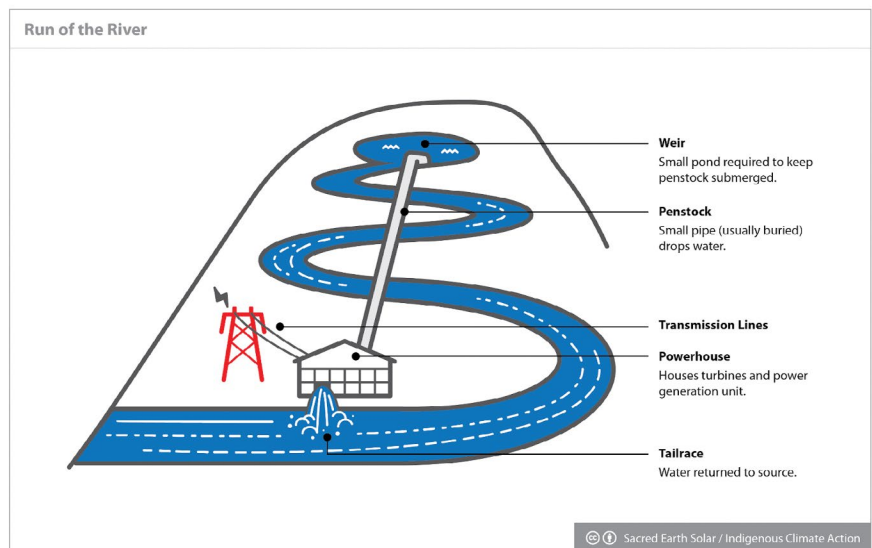
The flow of water in rivers is what allows us to generate hydropower - we rely both on the hydrological cycle and the force of gravity to move water from high to low elevations.<sup>168</sup> Hydropower currently provides 60% of Canada's electricity generation.<sup>169</sup> Many Nations across Turtle Island are ideal candidates for run-of-the-river and micro-hydro renewable energy projects. Run-of-the-river projects generate electricity by diverting a portion of water from mountain streams into a buried pipe, called "penstock."<sup>170</sup> The water is then channeled downstream and its force spins one or more turbines.<sup>171</sup> A generator is attached to the spinning turbine and creates electricity. The water from the turbine is then released back into the stream, unaffected.<sup>172</sup>

Indigenous-led run-of-the-river projects take great care to work within ecosystems while generating clean energy, ensuring minimal impact, and protecting life in and around their waters.

To be clear, micro-hydro and run-of-the-river projects use vastly different systems than large-scale dams or "big hydro," where water is typically impounded in a reservoir and downstream flow regulated, significantly altering the natural variation of the river and the surrounding landscape.<sup>173</sup> Large dams can have very damaging environmental and social impacts.<sup>174</sup>



**Figure 32:** Squamish Run-of-the-River Hydro system (photo credit: Power to the People, Real World Media)



**Figure 33.** A run-of-the-river hydro project (Source: SES/ICA)

<sup>168</sup> Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. *Renewable & Sustainable Energy Reviews* (39): 748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

<sup>169</sup> Natural Resources Canada. (N.d.). I. Government of Canada. <https://natural-resources.canada.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy/7295>.

<sup>170</sup> Clean Energy BC. (2023). Run-of-River Hydro Power. <https://cleanenergybc.org/sector/run-of-river/>.

<sup>171</sup> Ibid

<sup>172</sup> Ibid

<sup>173</sup> Ibid

<sup>174</sup> Hung, Christine. (2010). "Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results." Institut for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHjZdg>.



**Figure 34:** Transmission lines near Six Nations (photo credit: Power to the People, Real World Media)

## HYDROPOWER SUSTAINABILITY CONSIDERATIONS

The construction and operation of hydropower dams can significantly impact natural river systems, as well as the fish, wildlife, plants, and communities nearby. Large dams flood large tracts of land, destroy habitats and ecosystems, displace communities, submerge and anaerobically decay plant life, alter the migratory patterns of river species (such as salmon and trout), change downstream water quality, and restrict the flow of sediment and soil nutrients - among other impacts.<sup>175,176,177</sup> The materials used to build the dam or run-of-river facility, such as cement, concrete, and metals, also have impacts associated with the mining sector.<sup>178</sup>

As with all renewable energy projects, we need to be cautious of scale. Hydropower in particular can quickly become counterproductive in lowering GHGs as the scale of the project increases. There is a growing body of research to support the theory that global reservoirs emit more greenhouse gas emissions (particularly methane) than previously calculated.<sup>179,180</sup> Large hydroelectric dams are also often built upon sacred headwaters and culturally significant sites, which lead to Indigenous displacement - all while the energy generated benefits cities hundreds of kilometers away.<sup>181</sup>

## MEGA DAMS ARE NOT CLEAN ENERGY

Not every hydroelectric project is sustainable. Large-scale dams have major ecological impacts on local hydrology and can flood surrounding environment and communities.<sup>182</sup> Mega dams flood local vegetation and soils, causing a bacterial breakdown that

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- 175.** Klugmann-Radziemska, Ewa. (2014). Environmental impacts of renewable energy technologies. International Conference on Environmental Science and Technology. IPCBEE, Singapore: 104-109.
- 176.** Sayed, Enas Taha, Tabbi Wilberforce, Khaled Elsaid, Malek Kamal Hussien Rabaia, Mohammad Ali Abdelkareem, Kyu-Jung Chae, and A. G. Olabi. (2021). "A Critical Review on Environmental Impacts of Renewable Energy Systems and Mitigation Strategies: Wind, Hydro, Biomass and Geothermal." *The Science of the Total Environment*. 766: 144505–144505.
- 177.** Hung, Christine. (2010). "Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results." Institutt for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHjZdg>.
- 178.** Ibid.
- 179.** Lohan, Tara. (2022). Dam Accounting: Taking Stock of Methane Emissions From Reservoirs. *The Revelator*. <https://therevelator.org/methane-dams-reservoirs/>
- 180.** Harrison, J. A., Prairie, Y. T., Mercier-Blais, S., & Soued, C. (2021). Year-2020 global distribution and pathways of reservoir methane and carbon dioxide emissions according to the greenhouse gas from reservoirs (G-res) model. *Global Biogeochemical Cycles*. 35, e2020GB006888. <https://doi.org/10.1029/2020GB006888>
- 181.** Hendriks, R., Raphals, P., Bakker, K., and Christie, G. (2017). First Nations and Hydropower: The Case of British Columbia's Site C Dam Project. *Items: Insights from Social Sciences*. <https://items.ssrc.org/just-environments/first-nations-and-hydropower-the-case-of-british-columbias-site-c-dam-project/>
- 182.** Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. *Renewable & Sustainable Energy Reviews* (39):748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

triggers the natural environment's decomposition, emitting CO2 and methane.<sup>183,184</sup> The same process of decomposition also releases high volumes of methylmercury into the water, poisoning fish and those who rely on them for sustenance.<sup>185</sup>

Many hydroelectric projects have received substantial criticism from land users and community members who have been very vocal about the impacts on their traditional harvesting, hunting, trapping, and fishing territories. BC Hydro, for instance, has commandeered First Nations' territory and is destroying the Peace Valley - the best farmland in British Columbia - to build an unnecessary, expensive, and ecologically disastrous mega hydro dam known as Site C. The proposed project will be the third mega dam along the Peace River. Site C, which claims to produce clean energy, has not accounted for the vast amounts of methane it will emit.<sup>186,187</sup> Measured over a 20-year period, methane is projected to be 84 times more potent a greenhouse gas than CO2 over the next 100 years, rendering all of British Columbia's climate targets impossible.<sup>188</sup>

As the third mega dam on the river, the Site C dam will severely contribute to the dewatering of the delta and has the potential to lead to massive drought along the wetlands and basins, further releasing CO2 and methane. The deforestation and drought caused by Site C will also impact **carbon sinks**, further eliminating protective environments.

Sarah Cox, author of *Breaching the Peace*, describes how the impacts of the mega dam expand beyond the water itself, and the impacts will destroy habitat for more than 100 species already susceptible to extinction.<sup>190</sup>

With the misuse of the vibrant Peace Valley, not only will local sustenance be privy to eradication, but the potential to use farmlands for food security purposes will also be impacted.<sup>191</sup> In a time of rapidly changing environments, local ecosystems need to be protected for the health and wellbeing of all human and non-human kin.

"Often hydro is categorized in the renewable resources category but the impact on the territory is long term," says Aimée Craft, an Anishinaabe-Métis Law Professor at the University of Ottawa "As much as water can cycle through and be reused, there's still a significant impact on shoreline erosion and on the quality of water within territories, and then the impact of transmission lines."

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183. Palframan, Andrea. (2021). 7 Reasons Why Site C Dam is a Terrible Idea. Ravens Trust.

<https://raventrust.com/mega-dams-mega-damage/>.

184. Nikiforuk, Andrew. (2018). Megadams Not Clean or Green, Experts Say. The Tyee.

<https://thetyee.ca/News/2018/01/24/Megadams-Not-Clean-Green/>

185. Nikiforuk, Andrew. (2018). Megadams Not Clean or Green, Experts Say. The Tyee.

<https://thetyee.ca/News/2018/01/24/Megadams-Not-Clean-Green/>

186. Lavoie, Judith. (2016). Hydro Reservoirs Produce Way More Emissions Than We Thought: Study. The Narwhal.

<https://thenarwhal.ca/hydro-reservoirs-produce-way-more-emissions-we-thought-study/>.

187. Linitt, Carol. (2016). Site C Project Far From Clean and Green, Finds New UBC Report. The Narwhal.

<https://thenarwhal.ca/site-c-far-from-clean-green-finds-new-ubc-report>

188. United Nations Economic Commission for Europe. (N.d.). Methane Management - The Challenge.

<https://unece.org/challenge>.

189. Palframan, Andrea. (2021). 7 Reasons Why Site C Dam is a Terrible Idea. Ravens Trust.

<https://raventrust.com/mega-dams-mega-damage/>.

190. Cox, Sarah. (2018). *Breaching the Peace: The Site C Dam and a Valley's Stand against Big Hydro*. On Point Press.

191. Palframan, Andrea. (2021). 7 Reasons Why Site C Dam is a Terrible Idea. Ravens Trust.

<https://raventrust.com/mega-dams-mega-damage/>.



There is little evidence that Site C will benefit Indigenous communities and farming communities who have opposed the project from the beginning. Instead, we will see profits go to BC hydro as well as the fracking industry. BC Hydro, a publicly owned utility company, will provide \$56 million toward covering the \$82 million LNG Canada load interconnection project, which includes a new transmission line and substation upgrades - ultimately giving LNG Canada access to sufficient electricity for its Kitimat operations.<sup>192</sup>

This **neocolonial** project will further establish a monopoly on the provincial energy market by creating an energy surplus - meaning that small-scale, independent producers will be unable to sell the energy they produce back to the energy grid.<sup>193</sup> This effectively discourages the financing of any new run-of-the-river projects and prohibits any future Indigenous-owned projects from connecting to the grid. This shortsightedness wastes taxpayer dollars, destroys essential food producing regions, further threatens Indigenous jurisdiction on their own homelands, reinforces the cycle of First Nations' dependency on the state, and diverts from any meaningful effort to tackle climate change.

On top of the impacts to our lands, water, and atmosphere, there have also been immense impacts to Indigenous communities who have been forcibly removed from their homelands due to massive flooding of their territories.

## WISDOM FROM COMMUNITIES

### MUSKRAT FALLS THE REALITY OF HARM CREATED BY LARGE SCALE HYDRO

Below is a testimonial by Muskrat Falls community member, Ossie Michelin.

"I first went to my family's trapline in my father's canoe when I was two months old. My mother carried me to the cabin my grandfather had built, beside two older cabins going generations back. We would return to that cabin many times throughout my childhood. The hand carved logs that made the walls were all engraved with the names and dates of the different Labrador trappers who stayed there over the years. I can still remember tracing my fingers over the old weathered wood and seeing the names of my father, my uncles,

192. Cox, Sarah. (2019). B.C. subsidies to fossil fuel industry more than \$830 million last year. The Narwhal. <https://thenarwhal.ca/b-c-subsidies-to-fossil-fuel-industry-more-than-830-million-last-year/>

193. Government of British Columbia. (2019). Standing Offer Program – Results. <https://engage.gov.bc.ca/govtogetherbc/impact/standing-offer-program-results/#:~:text=The%20BC%20Hydro%20Standing%20Offer,small-scale%20renewable%20energy%20projects.&text=Suspending%20the%20SOP%20will%20reduce,rates%20for%20all%20British%20Columbians.>



grandfather, great-grandfather, neighbours, cousins and many other names I did not know. I carry the memory of the trapline and the cabin with me. They are now underwater and no one in my family will ever see this place again.

“For years, despite protests, hunger strikes, arrests of Elders, occupations, debates, court cases, international media attention, and scientific studies warning against it, our Provincial and Federal Governments proceeded with the Muskrat Falls Hydroelectric Project. And while I mourn the loss of my family’s legacy, of the place my father called “God’s Country,” I cannot sit idly by. The dam is located approximately 35 kilometers from Lake Melville where my community and the surrounding communities hunt, fish and gather. Researchers from Harvard University studied Lake Melville and concluded that the dam has the potential to **more than double methylmercury levels** in the lake, and in our food, for decades to come. This has forced us to have to decide between our physical health and our emotional and spiritual health, and will have grave repercussions on food security and cultural safety.

“The dam was built without taking into account the lives of us living downstream, our culture and way of life. The more I learn and the more I connect with other northern Indigenous Peoples the more I find out that what happened to my home is happening across the country, and shows no signs of stopping. Dr. Ryan Caulder from Harvard University reports that of all of the 22 new hydroelectric dams being considered in Canada, all of them are within 100 km from Indigenous communities.

“As Northerners, we are also feeling the effects of climate change, our weather patterns are changing, our coasts are eroding, and our way of life is threatened. By and large we support transitioning away from fossil fuels as a power source, but we cannot do so by relying on Big Hydro. Sacrificing local environments to flooding and methylmercury is not the way forward to fight against global climate change. Dams are still being built like it’s the 1970s, our understanding of their impacts has improved, and better, smaller-scale, less damaging alternatives have been created. We don’t have to let Big Hydro shape our lands and our lives anymore. We need new hydro regulations that put environmental and human health first, that champion Indigenous knowledge, push for strict environmental protections, and use the latest innovations to provide power and not poison for us all.”

Nakummek,

**OSSIE MICHELIN**





## KANAKA BAR FIRST NATION CLIMATE CHANGE MONITORING

Kanaka Bar has installed a permanent data logger that takes measurements every fifteen minutes to see if there are trends or changes in the base flow of their water. Serena Michell of Kanaka Bar First Nation explains, “It’s important for us to understand how much water we are using and consuming over time. Can we afford more projects down the road using the same water?”<sup>195</sup>

Reflecting on Kanaka Bar’s initiatives, Melina Laboucan-Massimo shares:

*“As someone that comes from inland, a lot of times we see water being desecrated and contaminated through resource extraction projects. It is always amazing to witness people’s connection and history to the water. With initiatives like run-of-the-river, it is pretty significant to witness the way the water is still being respected and not contaminated - how it’s being used culturally as well as for renewable energy.”*

## SHISHALH FIRST NATION CULTIVATING FRUITFUL PARTNERSHIPS

“We’ve been here for thousands of years. We’ve looked after our land. Nothing was ever destroyed. We don’t agree with big dams that flood the whole valley,” says Randy Joe, project liaison for Shishalh First Nation’s Narrows Inlet Hydro Facility run-of-the-river project. The actual name of this 33 MW project is Tems Sayamkwu, a name chosen by Shishalh elders, which means “strong flowing waters.”

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195. RealWorld Media. (2020). Power to the People. Episode 9: Kanaka Bar.  
<https://www.apntv.ca/powertothepeople/video/season-1/>

Shishalh First Nation was approached by Blue Earth Renewables (the same company that partnered with Squamish on their Culliton Creek project) fifteen years ago with the idea of partnering on a run-of-the-river project.

“The council of the day thought it was a great idea. A little smaller, a little more friendly to the environment and to all the wildlife that live in the area,” says Keith Julius, project liaison of the Narrows Inlet Hydro Facility and member of Shishalh Nation.

One of the project mandates was to ensure that the project could live up to its traditional name for the next three decades. “After the water comes out of the turbine, it falls down into a large pit, where the energy gets dissipated and is returned to the creek in what we call a tail race. We monitor water quality and temperature of both the natural creek and the water that goes through the turbines, and studies have shown that there is no difference [between the quality of the water that comes in and goes out],” describes community member Keith Julius.

*This project is the perfect example of a paradigm shift in energy systems, yet again led by First Nations - to meet the community’s needs while never taking more than necessary, leaving the land in even better shape than how it was found.*

“A big focus of my role was to make sure that construction proceeded with the lowest possible footprint,” says Isabelle Deguise, a non-Indigenous engineer and project manager with Blue Earth Renewables.

Shishalh First Nation’s partnership with Blue Earth has been a fruitful one. Dionne Paul, Nuxalk Nation (Bella Coola) and Shíshálh Nation (Sechelt) member, adds, “If any other First Nations across Canada can start building that relationship, I think it would be amazing for them.”

To learn more, watch [Power to the People Episode 6: Sechelt](#).

## **TLA-O-QUI-AHT FIRST NATION THE BENEFITS OF SMALL SCALE RUN-OF-THE-RIVER PROJECTS**

“We’re only working with the water that’s in the top 100 feet of the mountain. This is our watershed, We gotta get the salmon back, we gotta get the trees back to make sure the water is clean - our path is set to make change,” says Saya Masso, Lands and Resource manager for Tla-o-qui-aht Nation (located near Tofino, BC). Their community-owned Canoe Creek Hydro project generates 5 MW of energy, enough to power 2000 homes in Ucluelet, Tofino, Ahousaht, and their village of Opitsaht.

To learn more, watch [Power to the People Episode 10: Tla-o-qui-aht Nation](#).

## KANAKA BAR FIRST NATION THE BENEFITS OF SMALL SCALE RUN-OF-THE-RIVER PROJECTS

To construct Kanaka Bar First Nation's run-of-the-river project, the community had to travel seven kilometers up, to build an intake. Their run-of-the-river system diverts the water down a six foot pipe, which then drops down a naturally occurring cliff and spins four turbines - each capable of generating 15 MW of electricity.

"Part of a run-of-the-river project is the water is taken from a diversion point, harnessed, and returned back to the river. And it's elevated so no fish can be caught or stranded up here," says the community's Chief Patrick Michell.

To learn more, watch [Power to the People Episode 2: Kanaka Bar](#).

## YAKAMA NATION THE BENEFITS OF SMALL SCALE RUN-OF-THE-RIVER PROJECTS

[Yakama Power](#), the tribal utility of the Yakama Nation in Washington State, provides residential and commercial customers with run-of-the-river hydro electricity, internet and phone service.<sup>196,197</sup> Their website explains that creating long-term, skilled jobs was an important factor in their decision to expand into a full-fledged utility.<sup>198</sup> They are also evaluating a [woody biomass generation facility](#).<sup>199</sup>

## SQUAMISH FIRST NATION IN IT TO OWN IT

Squamish First Nation has also worked with their sacred waters to generate renewable energy that will benefit their community. "The reason why we chose this is because it's green, it's renewable, it's friendly to the environment, it can even enhance some of the fish and wildlife habitat!" says Joshua Joseph, councilor of Squamish.

Like many First Nations, Squamish First Nation has a strong need to connect modern innovations in energy to their culture and ancestry, which is why they chose to construct their power facility in the style of a traditional long house. The power that the Culliton Creek Hydro Project generates is then sold to BC Hydro, which generates revenue that Squamish then invests in a language immersion program. In forty years time, the income generated will provide enough revenue for Squamish to own the project outright.

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196. Yakama Power. (2015). Generation. <https://www.yakamapower.com/generation/>.

197. Yakama Power. (2015). Yakama Nation Power Projects.

[https://www.energy.gov/sites/prod/files/2016/01/f28/0911review\\_lewis.pdf](https://www.energy.gov/sites/prod/files/2016/01/f28/0911review_lewis.pdf).

198. Yakama Power. (2015). About Us. <https://www.yakamapower.com/about-us/>.

199. Yakama Power. (2015). Generation. <https://www.yakamapower.com/generation/>.

## 4.4

# EARTH: GEOEXCHANGE SYSTEMS

## WHAT IS GEOTHERMAL ENERGY?

Geothermal energy is provided by thermal energy from the earth's interior and can be an efficient way to produce renewable energy using natural processes.<sup>200</sup> It's important to note that while geothermal energy typically refers to large-scale electricity generation which takes place deep below the Earth's surface,<sup>201</sup> this Guide is primarily concerned with "shallow" geothermal systems like geexchange systems and heat pumps, as these are more commonly used across the country. Geothermal energy is not utilized in so-called Canada as it is in Iceland, where 85% of homes are heated this way.<sup>202</sup> "The heat energy contained below the earth's surface is about 100 billion times more than current world energy consumption." In contrast to the depth geothermal energy systems are known for, geexchange happens closer to the Earth's surface.

## GEOEXCHANGE SYSTEMS

**Geexchange systems**, ground-source heat pumps, and geothermal heat pumps (also known as low-temperature or shallow geothermal systems) utilize the constant temperature below the earth's surface as an exchange medium to heat and cool buildings.<sup>204</sup> Geexchange systems can be used in residential, commercial, and industrial buildings and have many technical, environmental and economic benefits.<sup>205</sup> The main advantage of these systems is that despite extreme seasonal temperature variations in many geographical locations, just a few feet below the earth's surface, the ground remains at a relatively consistent temperature (between 4°C and 10°C) year-round.<sup>206</sup> These underground temperatures are warmer than the air aboveground in the winter, and cooler in the summer - a geothermal heat pump effectively exchanges temperatures with the earth via a heat exchanger in the ground.<sup>207</sup> Other benefits of geexchange systems include lower maintenance and operating costs than conventional systems, less noise pollution, and no onsite emissions or indoor air pollutants.<sup>208</sup>

Geexchange systems have three main parts: a heating/cooling distribution system (ducts), an electric ground source heat pump, and subsurface pipes. A ground loop, consisting of these subsurface pipes, is buried below the ground or the surface of a water body. The pipes are filled with a heat-conducting, environmentally- friendly fluid.<sup>209</sup>

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200. Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. *Renewable & Sustainable Energy Reviews* (39):748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

201. Lovekin, Dave and Ngaio Hotte. 2010. Geexchange: Energy Under Foot. Pembina Institute. <https://www.pembina.org/reports/geoexchangefactsheet.pdf>.

202. Government of Iceland. (Nd.). Energy. <https://www.government.is/topics/business-and-industry/energy/>

203. Project Drawdown. (2020). Geothermal Energy. <https://drawdown.org/solutions/geothermal-power>.

204. Ibid.

205. Ibid.

206. Ibid.

207. Ibid.

208. Ibid.

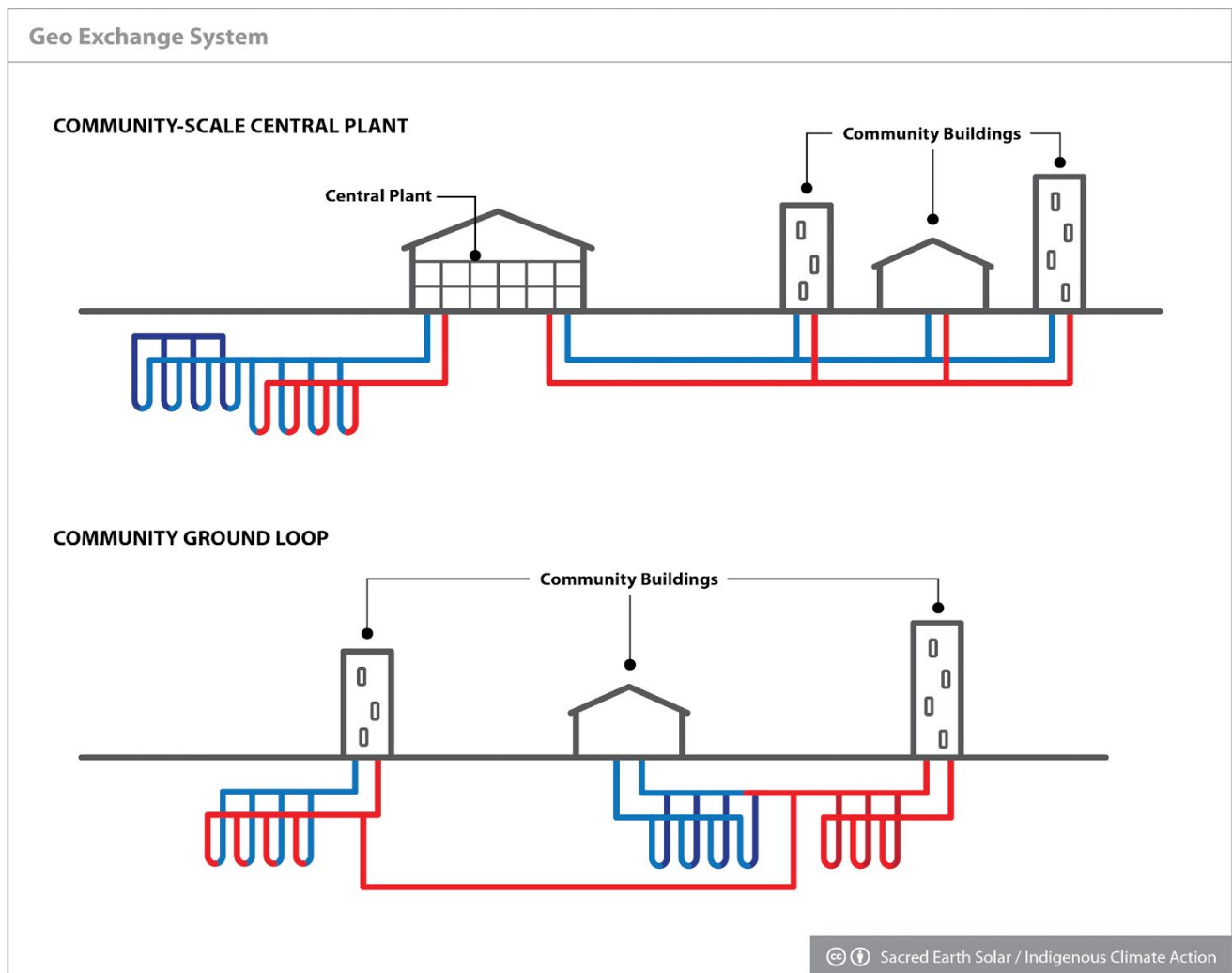
209. Ibid.

The outdoor piping system can be a closed-loop system or an open system.

In a closed-loop system, a continuous loop of piping is buried underground where heat is collected from the ground. The fluid in the piping loop then travels to the heat pump unit inside a given house where it passes through the heat exchanger to release the heat to the medium circulating inside the building. The fluid from the piping loop is then pumped back underground for the cycle to repeat.

In an open system, the groundwater is pumped back out and discharged into a pond or down a well. This process can also be reversed to provide cooling to the building. Loops may be oriented horizontally or vertically, depending on the cost and land area available. The main types of ground loop systems include:

1. Closed-loop systems: horizontal, vertical (borehole), and pond/lake
2. Open-loop system: horizontal or vertical, using a well or a surface body of water as the heat exchange fluid



**Figure 35.** Geoexchange system examples, including a community-scale central plant and a community ground loop (Source: SES/ICA)

## GEOHERMAL HEAT PUMPS

A heat pump is an important part of a geothermal exchange system - it is essentially an electrical device that extracts heat from one place and transfers it to another by circulating a substance known as a refrigerant (in liquid or gas form) through a cycle of evaporation and condensation. The most common components of a heat pump include the following:

- **Evaporator:** a coil in which the refrigerant is evaporated at low pressure, absorbing heat from its surroundings. This coil can be the exterior or interior heat exchanger depending on the cooling or heating mode properties of the heat pump. In a geexchange system, the ground loop transfers heat to the pump's working fluid.
- **Compressor:** compresses and increases the pressure of the gasified refrigerant, which in turn raises the fluid's temperature.
- **Condenser:** a coil in which the hot gasified refrigerant releases heat to its surroundings, condensing into liquid as it cools. This coil can be the exterior or interior heat exchanger depending on the cooling or heating mode properties of the heat pump. In a geexchange system, the heat pump's fluid transfers its heat to another piping loop which then carries the heat into a given building. The building loop fluid moves through the building piping system and releases heat into the surrounding environment. As this fluid cools, it returns to the heat pump to be heated once again.
- **Expansion valve:** back at the heat pump loop, the liquid refrigerant is expanded where its pressure drops. In a geexchange system, this cooler fluid is then sent back into the ground to absorb heat.

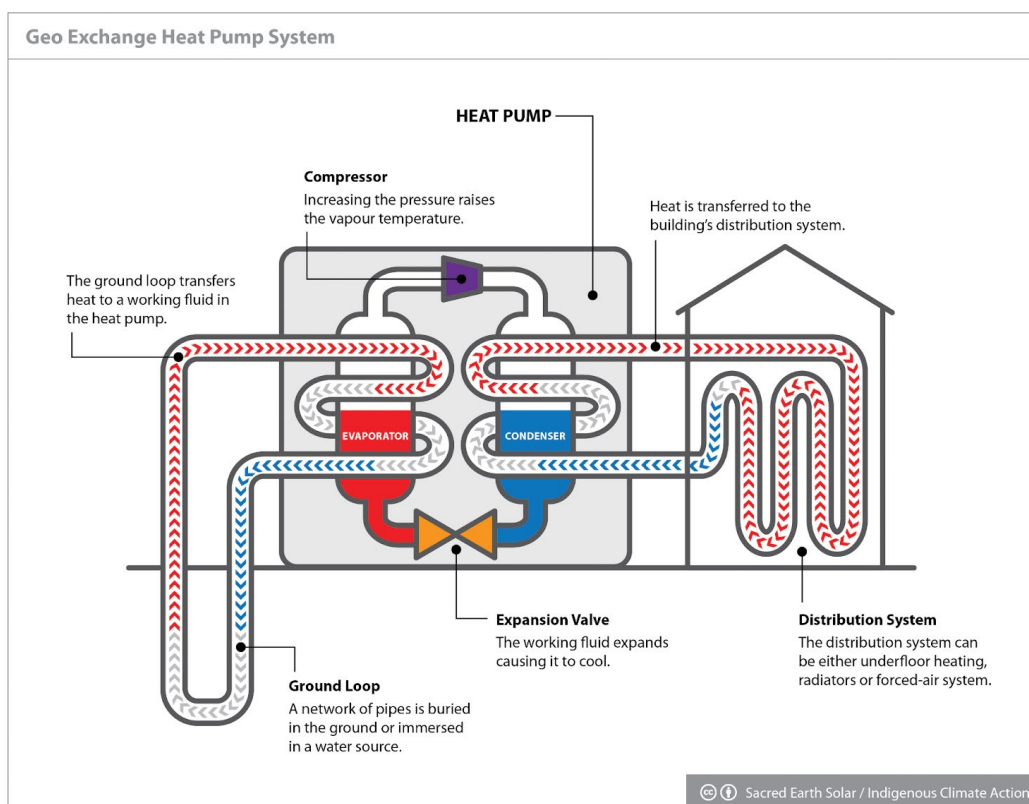


Figure 36. A geexchange heat pump system (Source: SES/ICA)

## ADVANTAGES & CONSIDERATIONS

Rather than converting fuel to heat, heat pumps transport heat directly, making them more efficient than baseboard heaters or furnaces. All heat pumps come with a backup heating system which usually kicks in when the temperature is too cold to allow for a heat transfer. These backup systems come in the form of gas furnaces or electric heaters. The ability of heat pumps to provide summer cooling as well as heating - increasing overall thermal comfort - reduces the need for supplemental air conditioning, thus contributing to climate resiliency within a given community.

Central air-source heat pumps work most efficiently in temperatures above 0°C. If the building is located in a colder climate, these units may not be that efficient during the winter months, as the backup heating system will need to kick in much more often to maintain a comfortable inside temperature. In colder temperatures, ground-source heat pumps are much more effective.

Heat pumps usually lead to reduced fuel expenses, though they may cause a slight increase in a building's electricity costs. Combining a ground-source heat pump with a solar panel system can offer an effective and economically feasible heating and cooling system for many buildings. A combined system provides full-scale heating in winter, air conditioning during summer at a lower energy consumption rate, and the heat pump can discard excess heat produced by the solar panels into the ground and store it for winter. **Recent studies** confirm that combining heat pumps with rooftop solar PV panels and building envelope improvements (i.e., upgrading doors and windows, improving insulation, and sealing leaks) is a cost-effective path towards electrifying homes while keeping heating expenses low.

## GEOHERMAL SUSTAINABILITY CONSIDERATIONS

The construction and drilling operations associated with geothermal energy may have visual impacts on the landscape, generate noise pollution, create geological hazards (such as landslides, seismic activity, rock fractures, and surface disturbances), produce waste, and impact groundwater and soil if adequate protections aren't put in place. Impacts to groundwater and soil can also affect animal and plant habitats, local residents, and the ecosystem at large.<sup>210,211,212</sup>

While geothermal systems can be really expensive to build, they may have long term economic benefits. That being said, their long term impacts are unclear. There have been reports of increased seismic activity and destabilization of geological formations in areas where large-scale geothermal projects and power plants are being developed and researched.

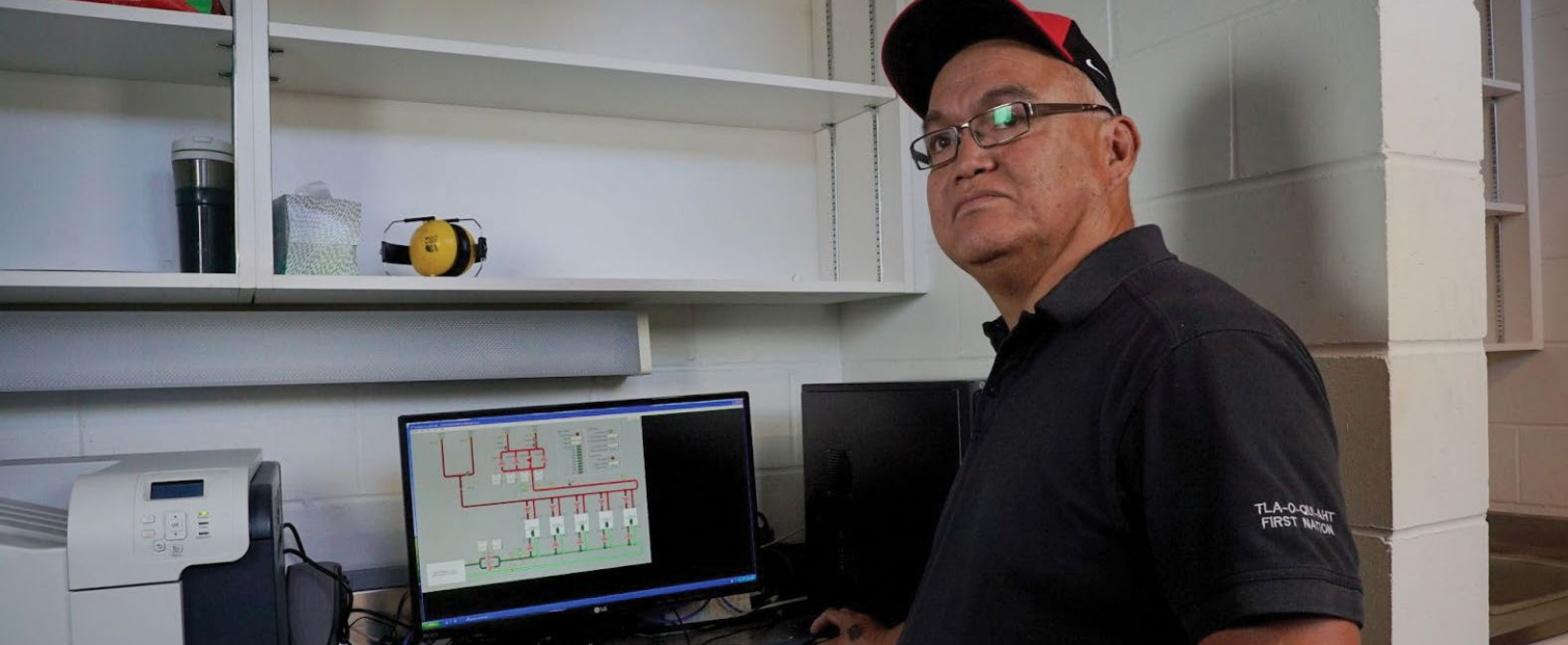
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210. Klugmann-Radziemska, Ewa. (2014). Environmental impacts of renewable energy technologies. International Conference on Environmental Science and Technology. IPCBEE, Singapore: 104-109.

211. Sayed, Enas Taha, Tabbi Wilberforce, Khaled Elsaid, Malek Kamal Hussien Rabaia, Mohammad Ali Abdelkareem, Kyu-Jung Chae, and A. G. Olabi. (2021). "A Critical Review on Environmental Impacts of Renewable Energy Systems and Mitigation Strategies: Wind, Hydro, Biomass and Geothermal." *The Science of the Total Environment*. 766: 144505–144505.

212. Hung, Christine. (2010). "Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results." Institutt for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHjZdg>.





**Figure 37:** Tla-o-quaht Nation member shows technology used to track the Geoexchange system (photo credit: Power to the People, Real World Media)

## WISDOM FROM COMMUNITIES

### TLA-O-QUI-AHT FIRST NATION BUILDING GEOEXCHANGE AS ADDITIONAL ENERGY PRODUCTION

Although geexchange may not be the first type of renewable energy system that springs to mind, many First Nations harness their power.

Geothermal technician and member of Tla-o-qui-aht First Nation, Desmond Tom, lives within walking distance of his community's geo-exchange facility. "From the field it goes into our geothermal building, where we have five heat pumps, which heat the water," he shares. "From there, it goes out to all the homes in the community."

Their system has two main piping systems, supply and return, which draw the hot water from the field and then return it once used - in one continuous loop. This system heats over ninety homes in their community, with the capacity for another forty.

Matthew Seitcher, Public Works Manager and member of Tla-o-Qui-Aht First Nation, observes, "Geoexchange is environmentally friendly and we're trying to be responsible to our own children, and our grandchildren, and eventually their grandchildren."

"By doing the run-of-the-river project, by doing geexchange, we're looking after our people," says Tla-o-Qui-Aht's Chief Terry Dorward. "We have a Tla-o-Qui-Aht solution here that we want to show the world, and hopefully they will get onboard. Everybody needs to be proactive in the defense of mother earth."

To learn more, watch [Power to the People Episode 10: Tla-o-qui-aht Nation](#).



## TAKU RIVER TLINGIT REPLACING DIESEL WITH GEO-EXCHANGE

The community of Atlin, of the Taku River Tlingit is using geoexchange to power their community and create new spaces in existing buildings - now that they have implemented their lake-looped system, they can convert buildings previously used for fossil fuel infrastructure into community spaces.

To learn more, watch [Power to the People Episode 11: Taku River Tlingit Nation](#).

### 4.5

## PLANTS: BIOMASS SYSTEMS

### WHAT IS BIOMASS?

Biomass is the organic material from plants, trees, and crops in which the sun's energy is stored via photosynthesis,<sup>213</sup> while biomass energy is the conversion of biomass into “useful energy,” such as heat, electricity, and liquid fuels. Biomass is typically generated by burning organic material to produce hot water, which in turn is used to heat homes and buildings. Biomass absorbs carbon dioxide by breaking down organic material and waste wood from landfills, construction sites, and land development for its operations. If these organic materials were instead left in landfills, the carbon dioxide would be emitted into the atmosphere rather than being used to produce energy. Of course, we always need to consider scale and broader emissions impacts when exploring biomass. Just like small scale hydro can be incredibly powerful and helpful, when pushed to large and mega scale sizes it can actually be detrimental. Scale matters.

When produced on a large scale, biomass is not sustainable - particularly when it necessitates clear cutting forests and old growth. In fact, biomass is only considered renewable when its rate of consumption does *not* exceed its rate of regeneration, and sustains small-scale operation.<sup>214</sup> In this Guide, we focus primarily on small-scale biomass systems and projects that use wood waste - it is important to stress that large-scale biomass systems are typically understood as unsustainable.

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<sup>213</sup>. Ellabban et al., “Renewable Energy Resources.”

<sup>214</sup>. Natural Resources Canada. “About Renewable Energy.”

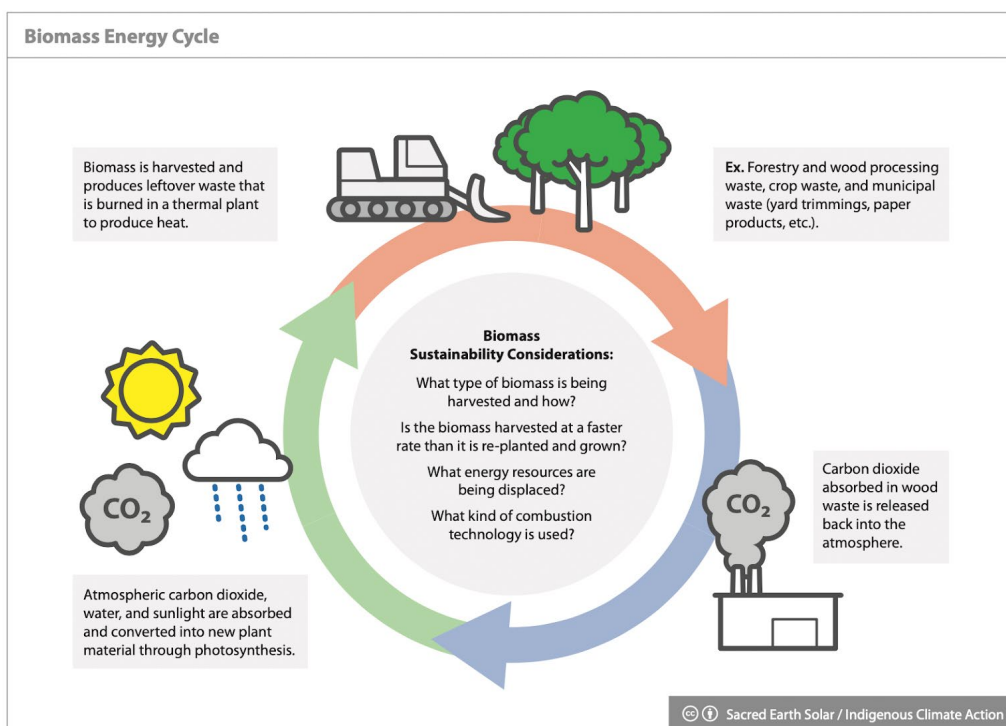


Figure 38. The biomass energy cycle (Source: SES/ICA)

## BIOMASS SUSTAINABILITY CONSIDERATIONS

Similar to fossil fuels, biomass requires combustion to generate electricity, leading to similar air pollution concerns, including greenhouse gas emissions associated with growing, harvesting, transporting, and burning organic matter.<sup>215</sup> In cases where biomass is grown for the sole purpose of producing organic matter, issues may include increased soil erosion, destruction of habitats and forests, overuse of land and water resources, high water run-off, loss of nutrients in soil, use of synthetic fertilizers, and loss of biodiversity.<sup>216,217,218</sup> Additionally, in some cases, the demand for biomass energy has created competition between food crops and biofuel crops, reducing the availability of food while increasing food prices.<sup>219</sup>

<sup>215</sup> Klugmann-Radziemska, Ewa. (2014). Environmental impacts of renewable energy technologies. International Conference on Environmental Science and Technology. IPCBEE, Singapore: 104-109.

<sup>216</sup> Sayed, Enas Taha, Tabbi Wilberforce, Khaled Elsaid, Malek Kamal Hussien Rabaia, Mohammad Ali Abdelkareem, Kyu-Jung Chae, and A. G. Olabi. (2021). "A Critical Review on Environmental Impacts of Renewable Energy Systems and Mitigation Strategies: Wind, Hydro, Biomass and Geothermal." *The Science of the Total Environment*. 766: 144505-144505.

<sup>217</sup> Abbasi, S. A., and Abbasi, Naseema. (2000). "The Likely Adverse Environmental Impacts of Renewable Energy Sources." *Applied Energy* 65, (1): 121-44.

<sup>218</sup> Hung, Christine. (2010). "Environmental Impacts of Renewable Energy: An Overview of Life Cycle Results." Institut for Energi-Og Prosessteknikk. <https://go.exlibris.link/LXHJZdg>.

<sup>219</sup> Ibid.



**Figure 39:** Teslin community member breaking down wood waste for their biomass project (photo credit: Power to the People, Real World Media)

## WISDOM FROM COMMUNITIES

### TESLIN TLINGIT FIRST NATION SUSTAINABLE BIOMASS SYSTEMS

The Tlingit community of Teslin, located in the Yukon, has turned to using a small-scale sustainable biomass system to meet their energy needs and employ their community.

Before the Teslin community decided to use biomass, diesel was burned to heat homes in the winter months. Since then, the Nation has worked to transform an old saw mill site into a biomass processing facility to heat homes for the community. The system uses “waste wood,” the byproduct of trees that have been cleared for roads, houses, and other local projects - so nothing actually goes to waste. The wood is first brought to the mill for processing, and to create sellable lumber - then, anything that can't be sold is chipped (broken down into wood chips by a machine) and used to produce biomass energy.

“My city and my community are at high risk of burning down, so biomass gives us an opportunity to divert and utilize those excesses,” says Blair Hogan, a member of the Teslin Tlingit First Nation and a biomass project developer.

Once the wood is chipped, it is divided into six-foot-deep square bays designed to store a large amount of broken down wood. Inside each bay, “sweepers” move the chips from side to side, knocking them into screw augers, which then pull the wood into a boiler located on the other side of the wall - each wood chip bay is attached to one 100 kW boiler. The boilers, which burn winterlong, need to run in order to keep the water tank hot, so that it can pipe hot water into houses and community buildings across Teslin. This system is known as **district energy**.

The community has also built new duplex homes which are heated via biomass, signifying a long-awaited transition away from diesel, which is known to be expensive and cause adverse health impacts.

Bobby, who lives in one of these homes, says, “When it's 40 below outside it's really nice and warm in here. Knowing that this heat is coming in locally and not being trucked in is huge! When we can create jobs locally, for a small town of 450, it is a really nice feeling!”

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220. RealWorld Media. (2020). Power to the People. Episode 5: Listuguj. <https://www.apntv.ca/powertothepeople/video/season-1/>.

Not only is Teslin generating energy and revenue for their community using this renewable source, but they are also using the leftover, non-toxic, charcoal byproducts to create paint for the local school's art classes.

To learn more, watch [Power to the People Episode 7: Teslin](#).

## 4.6 MIXED USE ENERGY, MICROGRIDS, AND DISTRICT ENERGY

*“Wind turbines will produce when it’s windy, solar energy will produce when it’s sunny - so if you have different energy sources, you have a better chance at meeting your energy demand and having a more stable or resilient grid.”<sup>220</sup>*

**MATTHEW WADHAM-GAGNON**  
Nergica

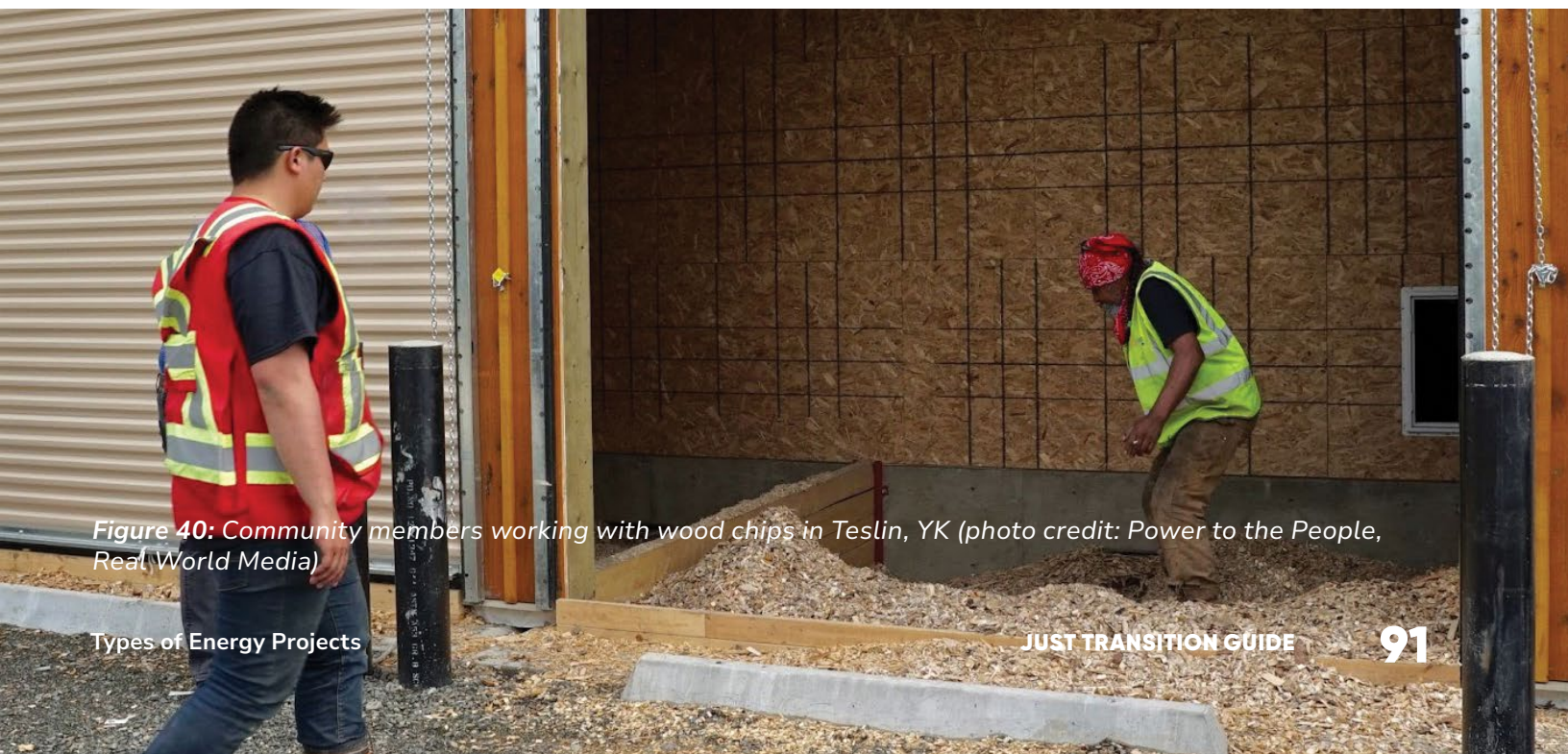


Figure 40: Community members working with wood chips in Teslin, YK (photo credit: Power to the People, Real World Media)



The industrial revolution mentality and attendant colonial policies were designed to keep the machinery of capitalism humming while suppressing the freedom of the original stewards of the land.

Before colonization, communities lived abundantly off of multiple food sources, had seasonal territories, and employed various methods to live rich and healthy lives without overtaxing the land, air, and water. The colonial systems since forced on Indigenous communities have driven us to dependence on cash economies and “one size fits all” solutions which don’t serve our people or Mother Earth.

In the transition from diesel to renewables, it is unlikely that one type of energy will fulfill all of a given community’s needs. That’s where microgrids come in. A **microgrid** is a small-scale, independent power grid made up of distributed electricity generation technologies (solar, wind, hydropower, etc.), and paired with energy storage, backup generation, and load management tools. Microgrids allow for localized and **mixed-use energy** sources, which help to increase community resilience and reduce the amount of energy lost in transmission and distribution.<sup>221</sup>

**District energy** also allows communities to harness multiple forms of renewable energy to heat buildings. District systems heat both water and indoor spaces more efficiently via a centralized, renewably-powered heating system which distributes generated heat to buildings through a network of insulated, buried pipes.<sup>222</sup>

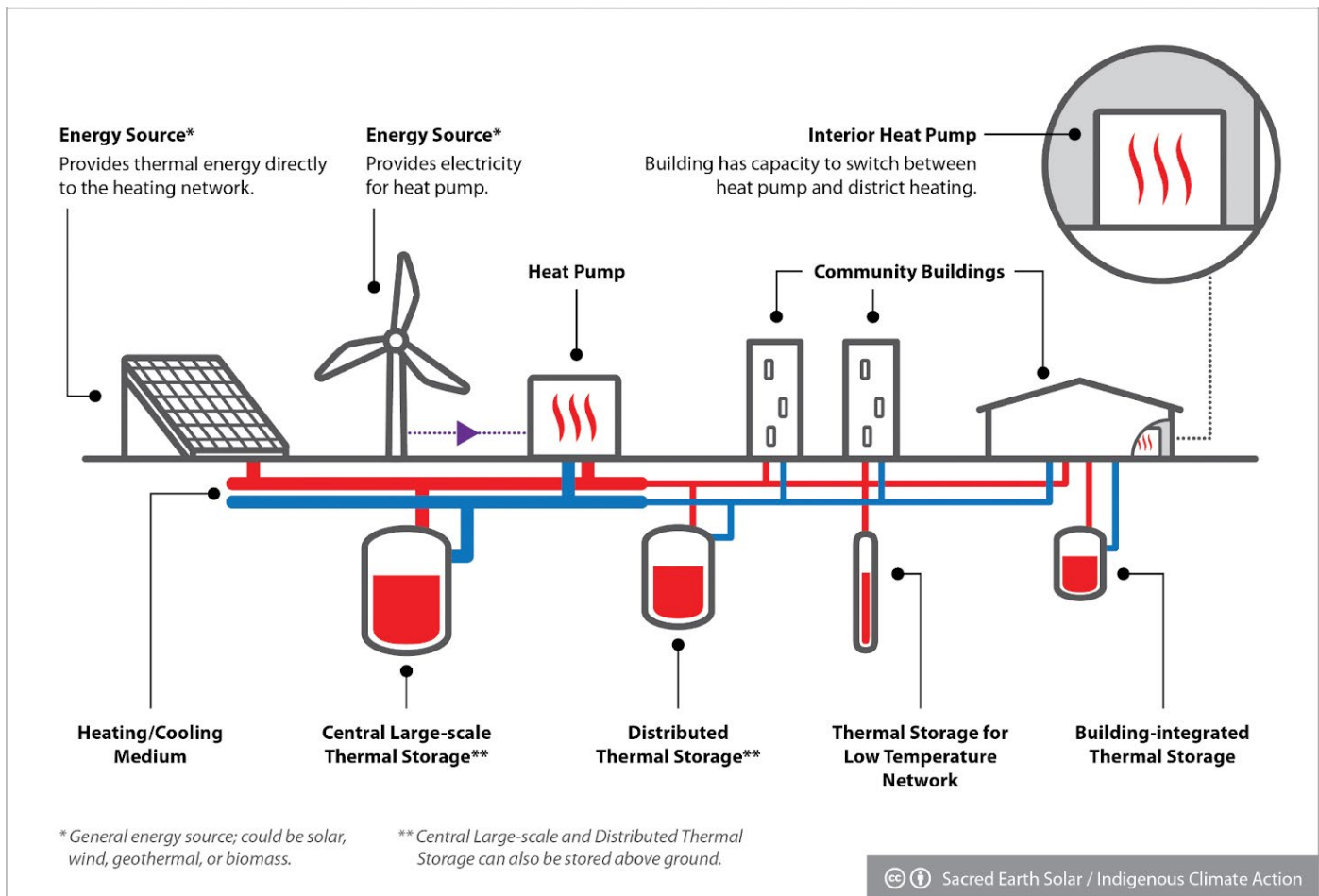
With over 170 diesel or propane dependent Indigenous communities which are not grid connected, the number of opportunities to create renewable energy systems can appear equal to the number of challenges. The sustainable use of the local, renewable resources available to us is key to a successful post-carbon energy landscape. Across Turtle Island, Indigenous communities are employing sustainable solutions, ranging from solar, biomass, geoexchange, run-of-the-river, heat pumps, and energy efficient homes. The momentum towards mixed-use and microgrid energy can be seen in the following examples from Haida Gwaii First Nation, Gull Bay First Nation, and Taku River Tlingit First Nation.

As Dionne Paul of the Shishalh (Sechelt) First Nation says, “If it’s wind power, solar, hydro, or tidal power, I definitely encourage that we start moving away from unsustainable energies.”

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221. Project Drawdown. (2020). Microgrids. <https://drawdown.org/solutions/microgrids>.

222. Project Drawdown. (2020). District Heating. <https://www.drawdown.org/solutions/district-heating>.



## WISDOM FROM COMMUNITIES

### HAIDA GWAII FIRST NATION THE POWER OF SOLAR

“It’s all about respect. Solar panels are a great way of showing respect to our environment,” says Hannah Edenshaw of Haida Gwaii First Nation. Her community, along with many other Indigenous communities across Turtle Island, from Kanaka Bar and Tofino to Haida Gwaii, are deploying a “mixed use” approach that will help them transition away from toxic diesel and rekindle a relationship of reciprocity with their environment. “The energy is going by us everyday. The sun is shining down. The wind is blowing past us. The tide is coming up. We can capture that and it’s traditionally the way it should be,” she explains.

Today Haida Gwaii still relies heavily on fossil fuels to power their homes. “The northern grid of Haida Gwaii is 100% powered by diesel. We are running generators 24/7 to keep our fridges on,” says Valine Brown, who is Haida, as well as the co-founder of [Swilawiid Sustainability Society](#). Besides the direct impact this dirty fuel has on the land, the Haida Nation has been facing the grim possibility of “hundreds of super tankers transiting through the Hecate Strait,” Valine adds.

Figure 41. District energy system (Source SES/ICA)



Figure 42: Haida Gwaii Biomass Facility (photo credit: Power to the People, Real World Media)

This grim situation is what inspired Valine to start a campaign called Project 0% Diesel. The community's first project was to solarize the Old Massett Youth Center and the Skidegate Youth Center with five kilowatt solar installations, as well as three remote youth rediscovery camps located in different parts of Haida Gwaii.

“We’ve been directly involved in some solar installations, to get the youth comfortable with getting their energy from the sun. Make that shift away from diesel and use the energy that’s around us,” says artist Jaalen Edenshaw, who is also a board member of Swiilawiid Sustainability Society.

Solar isn’t the only renewable source the Haida Nation is utilizing. Five years ago, the Old Massett Village Council installed a biomass facility to power the Masset Community Hall and three other community buildings.

“We built this to save Old Massett money, so we’re not spending as much on fuel and propane,” says Donald Edgers, Chief Councillor of the Old Massett Village Council.

The community is also following through on a plan to transition both Old Masset and Skidegate (technically two separate bands) completely off of diesel. The Haida village of Skidegate has made swift progress toward energy sovereignty, retrofitting every home with heat pumps which significantly reduce energy bills as well as dependency on electric heat and fuel furnaces.

Skidegate Band Council’s Climate Action Coordinator Holly Johnson provided an update in 2023 that the community is continuing to look at the feasibility and cost-effectiveness of a solar residential project for 360 homes in Skidegate outfitted with PV solar panels. Tll Yahda Energy (TYE), a partnership between Skidegate Band Council, Old Massett Village Council, and the Council of the Haida Nation will be examining the potential through a Micro-Solar and Storage demonstration project with BC Hydro. TYE is currently in the construction phase of a 2MW Solar farm on Haida Gwaii’s northern grid that will include battery storage.

The community led projects will increase energy reliability, reduce diesel pollution, provide local jobs and generate revenue to directly support Haida communities. The Haida Nation is working toward 100% diesel reduction on Haida Gwaii by 2030.

To learn more, watch [Power to the People Episode 4: Haida Gwaii](#).

## **GULL BAY FIRST NATION FROM DIESEL DEPENDENCY TO A SOLAR MICROGRID PROJECT**

Gull Bay First Nation has powered their community with diesel since the 1960s. They are one of four communities in Ontario who have never been hooked up to the grid, and yet the lake in their very own backyard is used to generate megawatts of power for other communities across Ontario.

Between the 1920s and 1950s, Ontario Power Generation built three dams that flooded huge areas of Gull Bay First Nations’ territory and destroyed their traditional burial grounds. There was a dispute between the GBFN and OPG over that grievance right up until 2014, when an apology was made and a settlement was reached to help them transition off of diesel by bringing clean energy to their community.

“They call it Mashkawiziiwin. That’s the title that I am. Energy holder. Power man. To be the liaison between Gull Bay First Nation, Ontario Power Generation, Government, Funders, and move this project forward,” says AJ Esquega, Mashkawiziiwin of Gull Bay’s Energy Projects.





**Figure 43:** AJ sharing teachings with Melina about medicines from Gull Bay (photo credit: Power to the People, Real World Media)

Gull Bay First Nation and OPG have since installed a 360 kW solar and energy storage microgrid facility. This system is integrated with the existing diesel generation station to offset about 25% (120,000 litres) of diesel annually. Gull Bay First Nation's Ma'iingan Development LP owns and operates the project, a rare opportunity given that it is the community's first project, not to mention one of considerable size.

"Once we do this, we'd like to share this with other remote diesel communities who are facing challenges. That's part of our value as Anishinaabek or First Nations people. When someone is struggling, you help them," AJ adds.

There is currently important research underway on how to help northern remote communities transition away from diesel. "The microgrid concept really came from the idea of a diesel system supporting a completely isolated, unconnected community. What we're talking about nowadays is renewable supported or high renewable penetration micro-grids with the idea of offsetting diesel," says Michael Carter, who works in Development at Canadian Solar - the company is partnering with the University of Waterloo to test how a variety of renewable energies would interact with microgrids, the aim being to help remote Northern communities move away from diesel.

To learn more, watch [Power to the People Episode 13: Gull Bay](#).

## **TAKU RIVER TLINGIT FIRST NATION UTILIZING MIXED RENEWABLE ENERGY TO DISPLACE DIESEL**

"There are a number of hard working people in this community, both Tlingit and non Tlingit, and collectively we work together to affect change in our community: a hydro project, retrofits, geothermal and other community projects are a part of that combined effort," says Peter Kirby, the CEO of Taku River Tlingit Group of Companies, located on the border of BC and the Yukon.



**Figure 44:** Transitioning from Diesel to Renewable energy in Taku River Tlingit Nation (photo credit: Power to the People, Real World Media)

The Taku River Tlingit have been 100% off diesel for a whole decade. Their run-of-the-river project, spearheaded by Peter Kirby, now heats the homes and businesses of both the Indigenous and non-Indigenous populations living in Atlin, BC, totaling 300 homes. Their portfolio of projects and energy efficiencies save them 4000 tons of greenhouse gas emissions per year, equivalent to 1,487,390 litres of diesel. The Taku River Tlingit have also implemented a geo-exchange system which heats their community buildings.

“By 2030 we will be totally off of fossil fuels, except transportation,” Peter adds.

To learn more, watch [Power to the People Episode 11: Taku River Tlingit Nation](#).

### **THREE NATIONS ENERGY, FORT CHIPEWYAN, AB COLLABORATING FOR CHANGE**

The trend continues to grow. In November 2020 the community of Fort Chipewyan **energized the largest fully Indigenous-owned solar + storage farm** in so-called Canada to date, at 2.2 MW. As with many other projects described in this Guide, it is a collaboration between several nations. In this case, the Mikisew Cree First Nation, Athabasca Chipewyan First Nation, and the Fort Chipewyan Métis Association formed a joint venture called **Three Nations Energy**, through which they collectively own the project. Alberta utility ATCO purchases the energy generated, and then distributes it to the community through the local grid. The energy generated by the farm will allow the total population of approximately 1000 to reduce their annual diesel use by 25%, or 800,000 litres.

Through their commitment to making these projects a reality, Indigenous communities are demonstrating what self determination and energy sovereignty look like - to Indigenous and settler communities alike.

# 4.7

## RENEWABLE ENERGY CONSIDERATIONS

Although renewable energy technologies are a significant improvement compared to fossil fuels in terms of reducing greenhouse gas emissions, they still have social and environmental impacts. These impacts occur throughout the entire life cycle of renewable energy production, including the sourcing of materials, transportation, construction, installation, operation, maintenance, decommissioning, and recycling or disposal. As we discovered in the [Decolonizing Climate Policy in Canada](#) report, climate change is often seen as being a technical or technological problem - a narrow perspective which fails to acknowledge technological limitations as well as unintended consequences, not to mention the disproportionate impacts and benefits of [clean energy](#) technologies.<sup>223</sup>

For example:

- A review of thousands of cases of environmental conflicts around the world showed that clean energy climate solutions such as wind and hydro disproportionately impact vulnerable groups, drive human rights abuses, and violate Indigenous rights.<sup>224</sup>
- As we move away from fossil fuel dependency to “green energy generation,” there will be a growing demand for the metals and minerals associated with many renewable energy technologies and infrastructure.<sup>225</sup> Many of these materials require mining operations which exploit the land and workers.<sup>226</sup> [MiningWatch Canada released a report with recommendations](#) on how the social and environmental impacts of mining activities can be reduced. The recommendations include focusing on reducing energy demand, protecting bodies of water from mining waste, respecting Indigenous rights, and improving policy.<sup>227</sup>
- The cumulative impacts of renewable energy projects on our natural systems is another concern – for example, a small run-of-the-river project may not appear to have significant impacts, but many projects on the same river system could, over time, have negative effects on local ecosystems, such as salmon runs.<sup>228</sup>

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223. Indigenous Climate Action. (2021). Decolonizing Climate Policy in Canada: Report from Phase One. Indigenous Climate Action. [https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf\\_critique\\_FINAL.pdf](https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf_critique_FINAL.pdf).

224. Temper, Leah, Sofia Avila, Daniela Del Bene, Jennifer Gobby, Nicolas Kosoy, Philippe Le Billon, Joan Martinez-Alier, Patricia Perkins, Brototi Roy, Arnim Scheidel, and Mariana Walter. (2020). “Movements shaping climate futures: A systematic mapping of protests against fossil fuel and low-carbon energy projects.” *Environmental research letters* 15 (12). <https://doi.org/10.1088/1748-9326/abc197>.

225. Yes to Life No to Mining. (2021). On the Frontlines of Lithium Extraction. <https://yestolifenotomining.org/latest-news/ylnm-lithium-communique/>.

226. Simmons, Matt. (2020). The Transition to Renewable Energy Relies on Mining. Can It Be Done Responsibly?. The Narwhal. <https://thenarwhal.ca/renewable-energy-transition-responsible-mining/>.

227. Mining Watch Canada. (2019). Turning Down The Heat: Can We Mine Our Way Out of the Climate Crisis?. [https://miningwatch.ca/sites/default/files/miningwatch\\_review\\_page.pdf](https://miningwatch.ca/sites/default/files/miningwatch_review_page.pdf).

228. Chung, Emily. (2011). Green power projects hit unexpected hurdles. CBC News. <https://www.cbc.ca/news/canada/green-power-projects-hit-unexpected-hurdles-1.1058196>.

**Table 1.** Summary of important considerations for each method of generating renewable energy outlined in this guide (adapted from Ellabban et al., 2014; Klugmann-Radziemska, 2014; Abbasi and Abbasi, 2000; Hung, 2010; Sayed et al., 2020). **Note:** the considerations and potential disadvantages outlined do not capture the full social impact on individual nations or communities.

ENERGY SOURCE	CONSIDERATIONS AND POTENTIAL DISADVANTAGES
Solar	<ul style="list-style-type: none"> <li>• Use of hazardous materials in manufacturing</li> <li>• Requires reliable sun exposure and energy storage</li> </ul>
Wind	<ul style="list-style-type: none"> <li>• Requires consistent strong winds</li> <li>• Potential habitat loss and impacts to birds and bats</li> <li>• Use of hazardous materials in manufacturing</li> <li>• May cause visual impact and some noise pollution</li> </ul>
Hydro	<ul style="list-style-type: none"> <li>• Large dams may flood surrounding communities and landscapes</li> <li>• Dams have major ecological impacts on local hydrology and are often not considered sustainable</li> </ul>
Geothermal	<ul style="list-style-type: none"> <li>• Startup, development, and maintenance costs can be high</li> </ul>
Biomass	<ul style="list-style-type: none"> <li>• Not considered sustainable on a large scale, particularly if it results in clear cutting</li> <li>• Only considered renewable and carbon neutral if the rate of biomass consumption does not exceed the rate of regeneration</li> </ul>
Nuclear (non-renewable)	<ul style="list-style-type: none"> <li>• Uranium is a non-renewable resource that requires land exploitation</li> <li>• Greenhouse gases and nuclear waste are byproducts of energy generation</li> <li>• Solutions for the safe disposal of nuclear waste have never been found</li> <li>• Energy Storage Sustainability Considerations – Lithium Ion Batteries</li> </ul>

## ENERGY STORAGE SUSTAINABILITY CONSIDERATIONS LITHIUM ION BATTERIES

As we search for new ways to store renewable energy, we must consider the negative impacts of energy storage technologies like lithium ion batteries. The mining and processing of lithium has been known to cause permanent and irreparable damage to natural water systems, ecosystems, biodiversity, and nearby communities, particularly in South America. In many cases, lithium mining projects have been established without the Free, Prior, and Informed Consent of Indigenous communities.<sup>229</sup> To achieve a Just Transition, communities must be able to fully understand the consequences of proposed mining projects, evaluate and implement changes to the mine that meet the needs of the community, and have the right to refuse mine development.<sup>230,231</sup> As we shift away from the use of fossil fuels, we have to be wary of how the extraction of lithium has the potential to replicate the same patterns of harm we're trying to move away from.<sup>232</sup>

## 4.8 URANIUM: NUCLEAR POWER

**Nuclear energy** has a long and sordid history particularly in Indigenous communities. Understanding the policies and impacts of Nuclear energy systems is critical in supporting our communities to be better prepared when faced with nuclear energy proposals in their homelands.

Nuclear power is the production of electricity via nuclear reactions. Nuclear energy is generated as a result of the conversion of mass into energy, and is released in two ways: by fission (splitting a heavy atomic nucleus in two), and by fusion (combining light atomic nuclei).<sup>233</sup>

Nuclear energy is widely regarded as non-renewable. Uranium, for instance, is used most widely by nuclear plants and is a non-renewable resource.<sup>234</sup> The greenhouse gases implicated in nuclear energy production and nuclear waste also present a considerable challenge to the industry - as does the attendant land exploitation. Solutions for the safe disposal of nuclear waste have never been found,<sup>235</sup> and the potential development and deployment of small modular reactors will only compound the waste issue, as small modular reactors produce more highly concentrated toxic waste.<sup>236</sup>

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229. Yes to Life No to Mining. (2021). On the Frontlines of Lithium Extraction.  
<https://yestolifenotomining.org/latest-news/ylnm-lithium-communique/>.

230. Ibid.

231. Ibid.

232. Ibid.

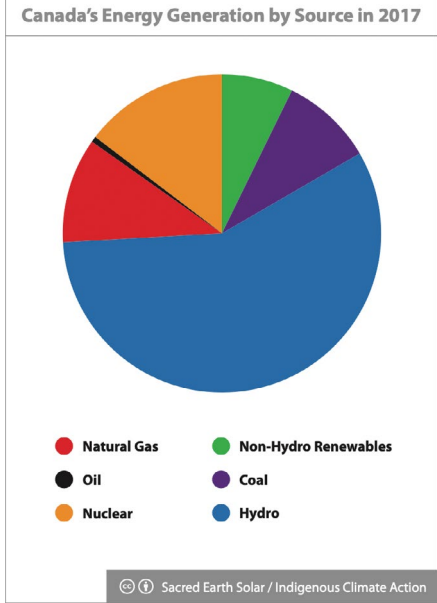
233. Oxford World Encyclopedia. (2004). Nuclear Energy.

<https://www.oxfordreference.com/view/10.1093/acref/9780199546091.001.0001/acref-9780199546091-e-8266>.

234. U.S. Energy Information Administration. (2020). Nuclear Explained. <https://www.eia.gov/energyexplained/nuclear/>.

235. Jacoby, Mitch. (2020). As nuclear waste piles up, scientists seek the best long-term storage solutions. Chemical and Engineering News. <https://cen.acs.org/environment/pollution/nuclear-waste-pile/scientists-seek-best/98/i12>.

236. Xu, Sikun George, Chester, Sarah, Choi, Kwansik, Bulemela, Ephraim, and Willenborg, Christian. (2020). Characteristic Waste Streams from Small Modular Reactors Considered for Deployment in Canada. CNL Nuclear Review 9(1): 83-92.  
<https://pubmed.ncbi.nlm.nih.gov/21631700/>



**Figure 45.** Canada's energy generation by source in 2017 (Image Source: SES/ICA. Data Source: Canada Energy Regulator)

## CANADA'S NUCLEAR POWER GENERATION

Canada developed its nuclear program based on the unique heavy-water natural uranium reactor system CANDU, which uses pressurized fuel channels rather than a pressure vessel; natural rather than enriched uranium; and **heavy water** as coolant or moderator rather than the light water found in pressurized water reactor designs.

As the 2nd largest producer and the 4th largest exporter of uranium in the world, 75% of so-called Canada's uranium production in 2019 was exported to fulfill the demand for nuclear power around the world. All of Canada's nuclear production uses high-grade deposits found in Saskatchewan, in regions like Cigar Lake Mine/McClean Lake Mill, McArthur River Mine, and Key Lake Mill. The raw uranium is then sent to Ontario for refining and processing.<sup>237</sup>

Although the majority of Canada's electricity is generated using hydro, nuclear power generation accounted for approximately 15% of Canada's electricity in 2018, while all other forms of electricity generation, including natural gas, coal, oil, and renewables accounted for 10% or less.<sup>238</sup>

**Figure 46.** Map of uranium processing, refining, conversion, fuel fabrication, research, and waste management across Canada. Nuclear power stations are located in Ontario and New Brunswick (Source: Natural Resources Canada)



237. Natural Resources Canada. (2021). Uranium and nuclear facts. <https://www.nrcan.gc.ca/science-and-data/data-and-analysis/energy-data-and-analysis/energy-facts/uranium-and-nuclear-power-facts/20070>

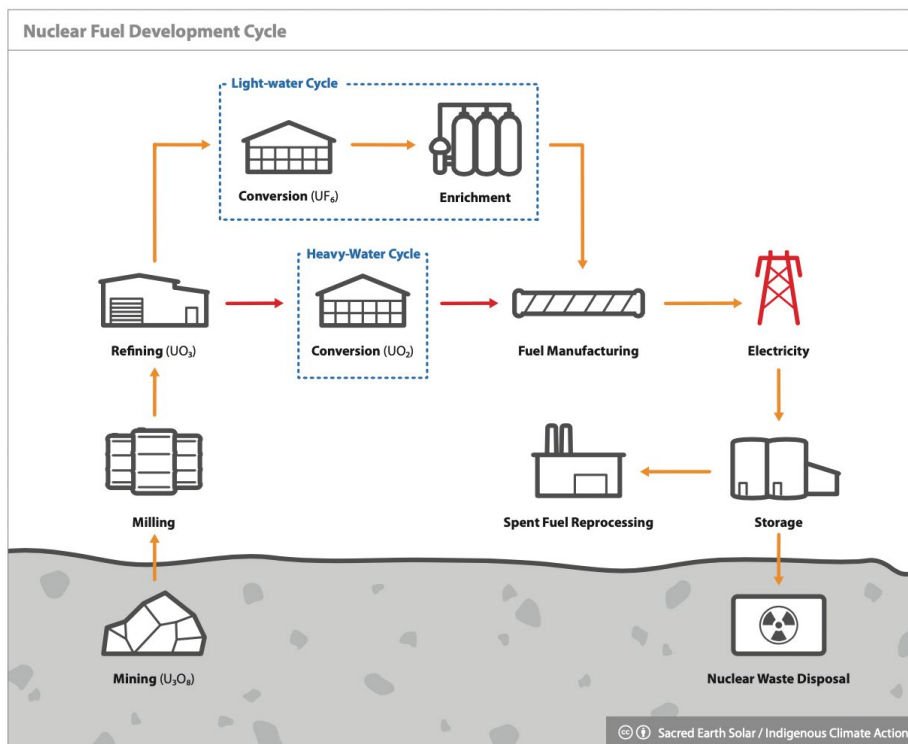
238. Ibid.

There are four active nuclear power stations in Canada, which have a combined capacity of approximately 14,200 MW. The Bruce Power station in Ontario is the largest operational nuclear power plant in the world.<sup>239</sup>

## NUCLEAR ENERGY GENERATION & SUSTAINABILITY

There is a myth that nuclear energy has zero emissions. The reality is that the nuclear power cycle consists of different stages during which greenhouse gasses are emitted: uranium mining; uranium milling; the conversion of uranium ore to uranium hexafluoride; uranium enrichment; fuel fabrication; reactor construction; reactor decommissioning; fuel reprocessing; nuclear waste disposal; mine site rehabilitation; and transport throughout all stages.<sup>240</sup> It should also not be taken for granted that many mining practices, as well as construction and manufacturing processes still rely on carbon-intensive energy sources, and as such, almost every aspect of nuclear power generation is reliant on fossil fuels.

Throughout all the stages of nuclear energy production, greenhouse gases are emitted directly - such as during transportation by truck, but also indirectly through the use of materials like steel and cement, which are manufactured using emissions-intensive processes. Indirect emissions are sometimes referred to as embedded emissions, and are often excluded from environmental impact assessments.



**Figure 47.** Nuclear fuel development cycle (Image Source: SES/ICA. Content Source: Canadian Nuclear Association)

239. Canada Energy Regulator. (2020). Nuclear Generation in Canada. <https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/electricity/report/2018-nuclear-energy/nuclear-generation-in-canada.html>

240. World Nuclear Association. (2021). Nuclear Fuel Cycle Overview. <https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/introduction/nuclear-fuel-cycle-overview.aspx>



There exists a broad range of estimations and debates around the true emission levels of nuclear power generation, but the consensus among scientists is simply that nuclear power generation is not emission-free. A review of various estimates suggests that greenhouse gas emissions from nuclear power vary between 10 to 130 grams of CO<sub>2</sub> per kWh of power, with an average of 65 grams per kWh. This is roughly the same as the estimated **life-cycle emissions** for wind power. For comparison's sake, coal power has emissions of about 900 grams per kWh, and gas-fired power about 450 grams per kWh.<sup>241</sup>

Approximately 15-25% of the greenhouse gases generated by the production of nuclear energy are emitted in the building, maintenance, and decommissioning phases of nuclear power plants.

A life-cycle assessment published by the Intergovernmental Panel on Climate Change (IPCC) shows median nuclear energy emissions as similar to that of renewable energy technologies, and notes that the upstream process of manufacturing most of the materials used in these technologies is still very carbon-intensive.

However, the IPCC report also includes an analysis of the energy ratios of different energy technologies, aka energy return on energy invested (EROEI). This analysis clearly illustrates that on average, renewable energy sources, including wind and photovoltaic solar systems, have a much higher EROEI than nuclear reactors, highlighting the energetic efficiency of renewable sources and their lower environmental footprint.<sup>242</sup>

## URANIUM EXTRACTION & LAND EXPLOITATION

Uranium deposits are finite and mined at a high cost to the environment. Unlike solar and wind energy, which can presumably provide to humanity for generations to come, uranium deposits, much like fossil fuels, are diminishing.

Those pushing for the inclusion of nuclear energy in the vision of a renewable future argue that the amount of uranium deposits available far exceeds the uranium that is considered extractable right now, indicating that it may be possible to fuel the earth with nuclear energy indefinitely. They are proposing the extraction of uranium from seawater, oceans, and the eroding earth crust found

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241. Lenzen, Manfred. (2015). Is nuclear power zero-emission? No, but it isn't high-emission either. The Conversation. <https://theconversation.com/is-nuclear-power-zero-emission-no-but-it-isnt-high-emission-either-41615>

242. Sathaye, J. et al. (2011). "Renewable Energy in the Context of Sustainable Development". Physics Faculty Publications. Paper 1. IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.



by river water.<sup>243</sup> This, however, will only expand the destruction of our ecosystems by the mining industry and unleash unprecedented violence against Mother Earth and Indigenous Peoples. This is the path green capitalists are pushing us towards, despite the fact that we're facing a global crisis that perpetuates the consumption of Mother Earth's ecological gifts 1.7 x faster than they can be regenerated.<sup>244</sup>

## SMALL MODULAR REACTORS (SMRS)

Small Modular Reactors (SMRs) are a new class of nuclear reactors which are considerably smaller in size and power output than conventional nuclear power reactors - less than 300 MW. They are also modular, which means the entire generation package is factory constructed, scalable, and can be shipped by rail. It is estimated that the fuel required to operate these modular reactors can last for 20-30 years before it needs to be removed and replaced.<sup>245</sup> The Canadian government released its SMR Action Plan in December 2020, outlining a path towards advancing and deploying this technology in different capacities.<sup>246</sup>

Global interest in SMRs is growing, mainly due to rapid changes in energy systems, fluctuating energy production needs, and the pressure on remote industrial complexes - such as mining facilities - to move away from fossil fuel-based power generation. Currently, there are around 50 SMRs in operation, in the design phase, or being developed on a global scale. Canada has joined the small group of advocates for this technology, which includes Argentina, China, and Russia.<sup>247</sup>

In its SMR Action Plan, Canada highlights the need for alternative energy solutions in remote and Indigenous communities - solutions which generate and distribute energy locally. SMR advocates claim this technology can play a key role in stabilizing power supplies and accelerating economic development for many nations. But while there is a real need to transition off-the-grid and remote communities from diesel fuel to alternative and sustainable energy sources, the sustainability and environmental footprint of SMRs should certainly be questioned.



**Figure 48.** An illustration highlighting the differences between the physical size and construction of a traditional nuclear power plant and a small modular reactor (Source: **Power Technology**)

<sup>243</sup>.Cohen, Bernard L. (1983). "Breeder reactors: A renewable energy source". Department of Physics. University of Pittsburgh. <http://large.stanford.edu/publications/coal/references/docs/pad11983cohen.pdf>

<sup>244</sup>.Global Footprint Network. (2021). Ecological Footprint. <https://www.footprintnetwork.org/our-work/ecological-footprint/>

<sup>245</sup>.Thomson, Jimmy. (2021). Is Canada betting big on small nuclear reactors? Here's what you need to know. The Narwhal. <https://thenarwhal.ca/canada-smr-nuclear-reactors-explained/>

<sup>246</sup>.Natural Resources Canada. (2021). Canada's Small Modular Reactor Action Plan. <https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/nuclear-energy-uranium/canadas-small-nuclear-reactor-action-plan/21183>

<sup>247</sup>.International Atomic Energy Agency. (2021). Small Modular Reactors (SMRs). <https://www.iaea.org/topics/small-modular-reactors>



Regardless of their size and power output, SMRs are dependent on the extraction of uranium as their primary fuel source. As such, to operate these reactors, the same uranium mines currently fueling Canada's conventional nuclear power plants must continue to exploit the land and poison the ecosystem. And the same cycle of violence and destruction of Mother Earth and Indigenous communities must continue.

Despite the Canadian Small Modular Reactor Roadmap Steering Committee mentioning the word "Indigenous" several times, only 50 individuals from 14 Indigenous organizations and communities participated in their Indigenous engagement sessions, which took place in New Brunswick, Alberta, and Nunavut, and focused on national, regional, and sub-regional organizations.<sup>248</sup> Parallel studies looking at consultations with Indigenous and remote communities on SMR development plans have found little evidence of meaningful or thorough engagement, so the Roadmap Steering Committee is just further proof of the same.

Nick Mercer, an energy researcher, recently published a report which showcases the deep concerns around nuclear power generation among Indigenous Peoples in Labrador. SMRs did very poorly in Mercer's study; only 8 adults out of 211 who were interviewed expressed any support for these reactors. These results are worse than the opinions around large-scale hydropower.<sup>249</sup>

## WISDOM FROM COMMUNITIES

### NAVAJO NATION HEALTH IMPACTS OF THE URANIUM INDUSTRY

In the United States, the lands of the Navajo Nation have been burdened with significant environmental deterioration, resulting in long-term health and social consequences for the Navajo. Several studies have found a strong correlation between uranium mining and lung cancer rates in Navajo men, and increased cases of other diseases have been detected as well, including thyroid cancer and birth defects.<sup>250</sup> To make matters worse, while both the government

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248. Canadian Small Modular Reactor Roadmap Steering Committee. (2018). "A Call to Action: A Canadian Roadmap for Small Modular Reactors." [https://smrroadmap.ca/wp-content/uploads/2018/11/SMRroadmap\\_EN\\_nov6\\_Web-1.pdf?x64773](https://smrroadmap.ca/wp-content/uploads/2018/11/SMRroadmap_EN_nov6_Web-1.pdf?x64773)

249. Mercer, Nicholas., Hudson, Amy., Martin, Debbie., Parker, Paul. (2020). "That's Our Traditional Way as Indigenous Peoples": Towards a Conceptual Framework for Understanding Community Support of Sustainable Energies in NunatuKavut, Labrador" Sustainability 12, (15): 6050. <https://doi.org/10.3390/su12156050>

250. Coates, Ken., Landrie-Parker, Dazawray. (2016). "Northern Indigenous Peoples & The Prospects for Nuclear Energy". <https://ourspace.uregina.ca/items/17a3d0a6-dffd-4254-9efb-8aaf38e7f3c2>.



**Figure 49.** A view of the vast McClean Lake Mill in northern Saskatchewan (Source: Canadian Nuclear Safety Commission)

and the industry knew of the dangers of these practices from the start, they did not consult with nor inform the Navajo Nation of the negative environmental and health impacts of the uranium industry's operations on their lands.

## IMPACTS OF NUCLEAR ENERGY ON INDIGENOUS NATIONS IN SO-CALLED CANADA

The relationship between Canada's uranium industry and Indigenous Peoples is riddled with controversy. Many uranium mining developments are on Indigenous lands, and are tied to historical and ongoing environmental, social, and health consequences in Indigenous communities. Nations in northern Saskatchewan, where most of Canada's current uranium mines are located, have certainly had their share of environmental and health impacts. There are countless stories of radiation exposure in workers, contamination of clean lakes with radioactive water, and the dreadful destruction necessitated by Saskatchewan's open-pit uranium mines. Unsurprisingly, these mining operations force many Cree and Dene Peoples to leave their homes and territories due to concerns about the mine waste these operations leave behind.

Jamie Keen of MiningWatch warns, "Eighty-five percent of the radioactivity that is in the rock is left behind in the mine waste. Then people need to know there are hundreds of millions of tonnes of that mine waste. And that radioactivity does not diminish for, well, literally millions of years."<sup>251</sup>

This waste is usually left behind in massive tailing ponds that pose a threat not only to the people living in these regions, but to the local water tables.

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<sup>251</sup>. Thomson, Jimmy. (2021). Is Canada betting big on small nuclear reactors? Here's what you need to know. The Narwhal. <https://thenarwhal.ca/canada-smr-nuclear-reactors-explained/>



**Figure 50.** Rows of chambers holding intermediate level radioactive waste, seen here in 2013 at the Bruce Power nuclear complex near Kincardine, Ontario (Source: CBC)

## NUCLEAR WASTE

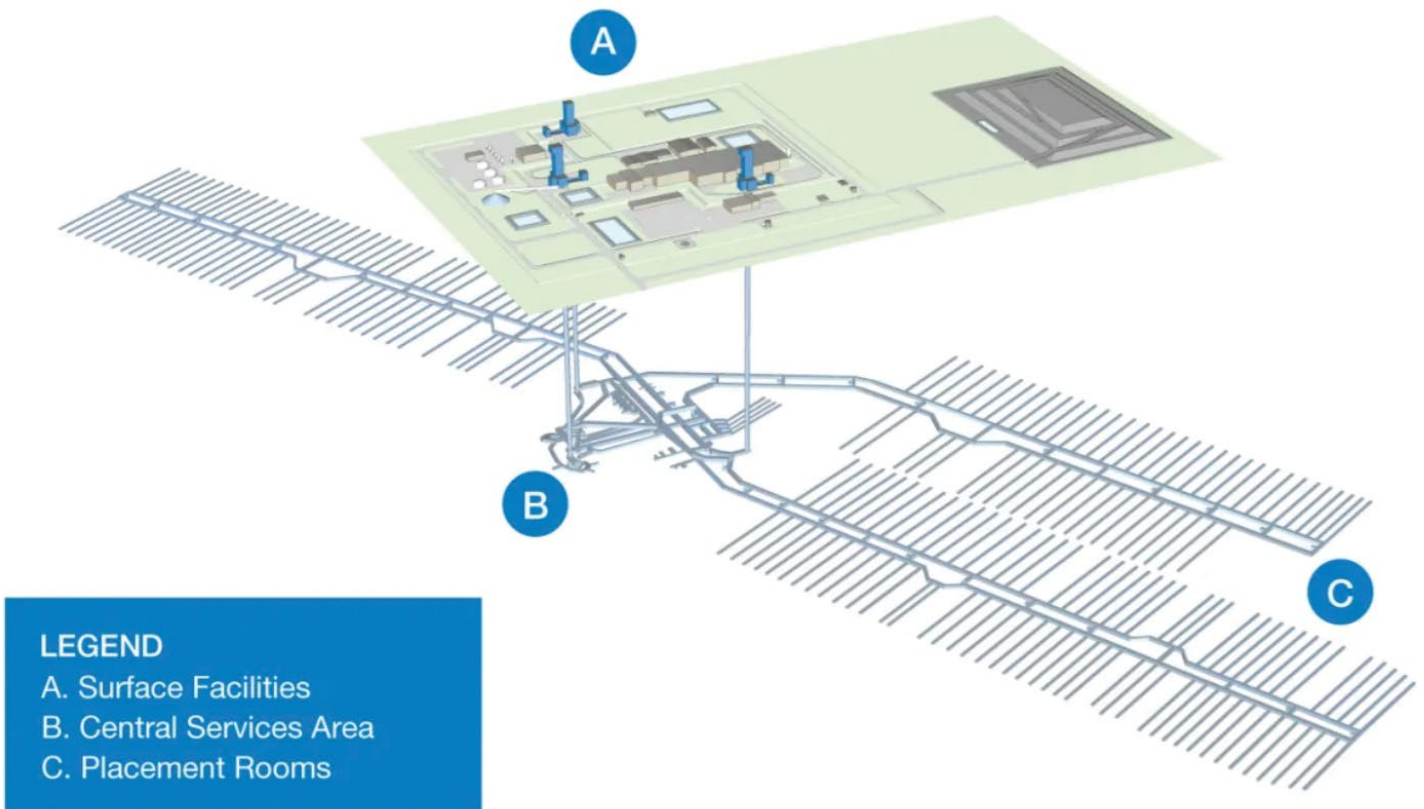
Eight decades into the nuclear age, we still have no concrete plans to manage and deal with nuclear waste. The vital question for our generation is this: should we burden future generations for our own short-term benefits? Those in pro-nuclear circles push the idea that spent nuclear fuel is not waste. Esmá Hussein, the University of Regina's dean of engineering and applied science, believes that this spent fuel will become both valuable and usable approximately 500 years from now.<sup>252</sup>

Even in a hypothetical scenario where spent nuclear fuel becomes usable, there is still a span of 500 years during which future generations are left with piles of potentially dangerous material which can cause all manner of health, environmental, and social damages.

The negative ecological and social impacts of uranium extraction, nuclear power generation, and radioactive waste are undeniable and significant. The lesson is clear for anyone paying attention:

*The transition to sustainable energy sources should not rely on further extraction and destruction of ecosystems while communities are left - yet again - to deal with the aftermath.*

251. Ibid



**Figure 51.** A deep, vast underground network of chambers built as a high tech nuclear dump for permanently holding spent nuclear fuel - also known as a deep geologic repository (Source: CBC)





## BEYOND RENEWABLE ENERGY

*“The Just Transition must advance ecological resilience, reduce resource consumption, restore biodiversity and traditional ways of life, and undermine extractive economies, including capitalism, that erode the ecological basis of our collective wellbeing. [...] A Just Transition centers on the development of human potential, creating opportunities for people to learn, grow, and develop to their full capacities and interests.”<sup>253</sup>*

**CLIMATE JUSTICE ALLIANCE**

The principles and strategies of a Just Transition do not solely advocate for a just energy system - they also advocate for just relationships with each other and with the natural world. In the following section, we describe how a Just Transition applies to daily life - from our food systems, to our homes, our cultures, and our traditional teachings.



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253. Climate Justice Alliance. (N.d). Just Transition: A Framework For Change. <https://climatejusticealliance.org/just-transition/>



**Figure 52:** Going in the big canoe with the Sechelt Nation (photo credit: Power to the People, Real World Media)

## 5.1

## CULTURAL REVITALIZATION AND TRADITIONAL TEACHINGS

*“Capitalism has forced many communities to sacrifice culture and tradition for economic survival. It has also defaced and destroyed land held as sacred. [The Just Transition] should also make reparations for land that has been stolen and/or destroyed by capitalism, colonialism, patriarchy, genocide and slavery.”<sup>254</sup>*

### CLIMATE JUSTICE ALLIANCE

Renewable energy projects and other sustainability-focused initiatives can provide social and cultural benefits to Indigenous communities. For instance, the revenue and money saved from implementing renewable energy projects can be reinvested back into community education. These projects can also offer opportunities for Indigenous resurgence and resilience - our wisdom, languages, cultures, traditional knowledge, and laws can thrive when our communities live in alignment with their values.

Traditional instructions and protocols for how to work in harmony with Mother Earth are embedded in the cultures, ceremonies, languages, and relationships we share with each other and the natural world. By deepening and regenerating this knowledge, viable climate solutions are possible.

<sup>254</sup>.Ibid.



**Figure 53:** Teaching youth culture in Squamish First Nation (photo credit: Power to the People, Real World Media)

## WISDOM FROM COMMUNITIES

### LISTUGUJ FIRST NATION EDUCATION AS A PATH TO TRANSITION

Listuguj First Nation has made it a high priority to reinvest the money they've made from their wind farms into education. "One of the things that we teach them from kindergarten is that everything has a spirit," shares Brenda Germain, teacher at the Gaspé community school. "So when we go on the land, we make sure they know the trees have spirits. We do that even before we teach language arts."<sup>255</sup> The students at the school also practice Mi'kmaq every day and have a language immersion class once a week.

### SQUAMISH FIRST NATION THE LAND AS OUR TEACHER

Squamish First Nation exemplifies a similar commitment to the land by bringing students directly into nature. Although their school is not exclusively Indigenous, this is part of the programming offered by the Squamish school district.

"Our students have a deep understanding of Aboriginal ways of knowing, being, and doing, and a deep respect for the land. When we're going out and gathering plants, if they hadn't learned, they might walk past and think 'oh that's a weed.' Now that they have a connection to that plant, they see that plant as food, they see that plant as medicine,"<sup>256</sup> says Charlene Williams, teacher at the local Squamish school.

<sup>255</sup>. RealWorld Media. (2020) Power to the People. Episode 12: Listuguj. <https://www.apntv.ca/power-to-the-people/video/season-1/>

<sup>256</sup>. RealWorld Media. (2020). Power to the People. Episode 6: Sechelt Nation. <https://www.apntv.ca/power-to-the-people/video/season-1/>.



## GULL BAY FIRST NATION BRINGING TRADITIONAL LAND PRACTICES AND CLIMATE LITERACY TOGETHER

Gull Bay First Nation has made an effort to promote energy literacy for their youth, including holding an energy fair for the community where they offered information sessions about their microgrid solar project, moose hide scraping, wild rice, and other traditional knowledge and skills that help bridge the gap between long held customs and new practices beneficial to their community.

“I travelled up the highway to Armstrong Public School multiple times to give presentations on the Gull Bay solar microgrid project, and mentor the youth in the Youth Fusion programming. It recharges you, inspires you, when you work with Youth and they feel a part in taking care of the environment and combating climate change,”<sup>257</sup> says Gull Bay Mashkawiziiwin AJ Esquega.

## TAKU RIVER AND TESLIN TLINGIT FIRST NATIONS KEEPING TRADITION ALIVE SO CULTURE CAN THRIVE

Many renewable energy projects are instrumental in helping communities restore their culture. “Our culture was almost wiped out,” says Wayne Carlick, master carver for Taku River Tlingit Nation. “To bring something back to our people that is meaningful, not only can we see our art, we can touch it, feel it, and make it. For a long time there were no [carved] poles here in Atlin, so hopefully in the next while we’ll have more of these going up.” Holding back tears he adds, “I know it won’t be lost. Ever again. They won’t take it away, not anymore.”

The wood that Teslin Tlingit First Nation has collected has helped them transition off of diesel, heat their homes, create jobs, and keep important traditions alive for future generations. The Teslin Tlingit Heritage Center was constructed by the citizens of the community, and built entirely from that “waste wood.” It is precisely because of cultural learning centres such as this that Indigenous Peoples have an opportunity to reconnect with their culture, heritage, and language.

“One of the key parts of North American genocide was to remove language, so when we talk about decolonization, we’re really trying to rectify generations of violence. We create really safe spaces to learn and use the language. There are only one hundred people left who can speak Tlingit. We’re done going down. We go up from here!” says community member X’unei, also known as Lance Twitchell.



**Figure 54:** A lesson in energy literacy with youth in Gull Bay First Nation (photo credit: Power to the People, Real World Media)



**Figure 55:** Carving with community members from Taku River Tlingit (photo credit: Power to the People, Real World Media)

<sup>257</sup>. Esquega, Anthony. (2021). Gull Bay First Nation. Personal communication with Melina Laboucan-Massimo during filming of Power to the People, regarding just transition policy and Gull Bay First Nation.

“When there are structures built which are places of gathering, it creates a robust resiliency within communities. To see young people interested in learning and helping their language thrive again was a pretty hopeful thing to witness,” says Melina Laboucan-Massimo.

Laura Nolan of the Teslin Tlingit First Nation takes advantage of healthy forests to pick local medicines like Goldenrod Leaf, Fireweed, Devil’s Club, Raspberry Leaf, Cramp Bark, Red Clover, and Spruce tips. She shares her knowledge with the community at the heritage center.

## 5.2

## INDIGENOUS FOOD SOVEREIGNTY



Figure 56. The elements of Indigenous Food Sovereignty (Source: )

“When you have food sovereignty, you are free to be self-reliant: to grow your own food, to choose the foods you want to eat, the foods you want to put in school systems, and be truly sustainable.”

**CLAYTON HARVEY**

White Mountain Apache Nation

*“We have relationships with food going back to before the beginning of time in the Skyworld, before the creation of the place we now call Earth. In the ethnological records from the 1600s, we see Jesuit observations of an incredibly rich agricultural tradition, led particularly by women and with a direct link between the landscape (hunting, fishing, gathering) and the Great Law. I went back through all the Haudenosaunee histories and reframed them through food. I looked at the relationships of all the players or elements in the Creation Story as family members and their role in what we now consider the scientific way of growing food – you need the sun, moon, stars, wind, and rain, all those things.”<sup>258</sup>*

**CHANDRA MARACLE**

Founder of Kakhwa'on:we (Real People Eat Real Food)

As the human population grows and consumption increases, our ecological relatives (other species from Turtle Island) are displaced by industrial agriculture and invasive species like giant hogweed and garlic mustard. Wild lands that should be home to a variety of animals, plants, and insects have been destroyed and converted to accommodate large-scale industrial agriculture. Modern farming, also known as monoculture, was designed to dominate the landscape with a single crop, which requires extensive use of fertilizers and pesticides.<sup>259</sup> International research shows that monoculture crops are detrimental to nature and human wellbeing - leading to soil erosion, fertilizer runoff, wildlife habitat loss, destruction of ecosystems, and devastating impacts on pollinators.<sup>260</sup> The lack of diversity in a monoculture system threatens the natural balance which exists to maintain the soil and the overall ecosystem.<sup>261</sup>

The current global food system is rooted in imperialism, capitalism, colonialism, and the patriarchy.<sup>262</sup> Foundational to the industrial food system is slavery, exploitation, and the theft of land, labour, and the products of marginalized communities.<sup>263</sup> Systemic inequalities such as these heavily restrict our communities' access to healthy, culturally-appropriate, and affordable foods.

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<sup>258</sup>. Maracle, Chandra, and Ian Mosby. (N.d.). The Mush Hole: Colonial Food Legacies among the Haudenosaunee. Earth to Tables Legacies. <https://earthtotables.org/essays/mush-hole/>.

<sup>259</sup>. Wetzel, W., Kharouba, H., Robinson, M. et al. (2016). “Variability in plant nutrients reduces insect herbivore performance.” Nature 539, 425–427. <https://doi.org/10.1038/nature20140>

<sup>260</sup>. Saunders, Manu E. (2016). “Resource connectivity for beneficial insects in landscapes dominated by monoculture tree crop plantations.” International Journal of Agricultural Sustainability, 14:1, 82-99, DOI: 10.1080/14735903.2015.1025496

<sup>261</sup>. Bennett, A.J., Bending, G.D., Chandler, D., Hilton, S. and Mills, P. (2012). “Meeting the demand for crop production: the challenge of yield decline in crops grown in short rotations.” Biological Reviews, 87: 52-71. <https://pubmed.ncbi.nlm.nih.gov/21631700/>.

<sup>262</sup>. Holt-Giménez, Eric. (2018). “Overcoming the Barrier of Racism in Our Capitalist Food System.” Food First Backgrounder 42, no. 1. [https://foodfirst.org/wp-content/uploads/2018/03/Backgrounder\\_Spring\\_2018\\_Final.pdf](https://foodfirst.org/wp-content/uploads/2018/03/Backgrounder_Spring_2018_Final.pdf).

<sup>261</sup>. Ibid.



**Figure 57:** Member of Gull Bay First Nation cleaning a moose after hunting (photo credit: Power to the People, Real World Media)

Food sovereignty was defined by La Via Campesina as "The right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems."<sup>264</sup> According to the Indigenous Food Systems Network in British Columbia, **Indigenous food sovereignty** addresses "the underlying issues impacting Indigenous Peoples and our ability to respond to our own needs for healthy, culturally adapted Indigenous foods."<sup>265</sup>

The Indigenous food sovereignty movement emphasizes the revitalization of Indigenous foods and ecological knowledge systems as an act of decolonization, allowing Indigenous Peoples to have ultimate control and influence over their food system as a primary contributor to health.<sup>266</sup>

To feed our communities while also reversing the damages of industrial agriculture, it's necessary to shift the focus of our food system to local and sustainable farming. A sustainable farm is designed to conserve biodiversity, maintain ecosystem function, use resources wisely, and provide a community with healthy produce. Permaculture is an example of sustainable agriculture which promotes biodiversity and the implementation of a diverse range of crops.

Indigenous Nations have relied on sustainable food systems for thousands of years - long before any of the modern theories around eco-agriculture and permaculture were widely researched. Many of these traditional food systems were prohibited due to colonial policies and the attendant destruction of traditional territories. Indigenous scholars rightfully identify the colonial control and unlawful occupation of Indigenous land as barriers to Indigenous food sovereignty.<sup>267</sup> Food provides an intimate connection to the land, our communities, our health, our ancestors, and our future generations. Restoring traditional foodways and achieving Indigenous food sovereignty are critical forms of resistance to colonialism and climate change - resistance that benefits all.

264. La Via Campesina. (2007). "Declaration Of Nyeleni." <https://nyeleni.org/IMG/pdf/DeclNyeleni-en.pdf>

265. Indigenous Food Systems Network. (N.d). "Indigenous Food Sovereignty." <https://www.indigenousfoodsystems.org/food-sovereignty>

266. Daigle, M. (2019). "Tracing The Terrain Of Indigenous Food Sovereignities". The Journal of Peasant Studies, 46(2), 297-315. doi :10.1080/03066150.2017.1324423

267. Peña, Devon G., et al., editors. (2017). "Mexican-Origin Foods, Foodways, and Social Movements: Decolonial Perspectives". University of Arkansas Press. JSTOR, <https://doi.org/10.2307/j.ctt1t89jww>.

## WISDOM FROM COMMUNITIES

### KANAKA BAR FIRST NATION CREATING FOOD SELF-SUFFICIENCY

The Kanaka Bar First Nation has implemented a mixture of energy, food, and water security projects which will prepare future generations for the devastating impacts of global warming and drought. As far as Chief Patrick Michell is concerned, it is important to ask the question, “Where is Kanaka Bar most vulnerable now and what are the steps we can take to mitigate these vulnerabilities?”

In their territory, the temperature fluctuates between +40 °C in the summer and -40 °C in the winter, which has led Kanaka Bar to build a solar greenhouse so they can grow food year round. The community is improving their food security in a diversity of ways, by building green houses, planting diverse edible plants that mimic forests and nature (food forests),<sup>268</sup> raising chickens, and keeping bee hives.

“Everything in our garden has a purpose, whether that’s food or medicinal. These are linden trees, one of the few trees that we can eat the leaves. The overall plan for this is to be a food forest and not a garden,” says Serena Michell. “Our goal is to have bees, chickens, and gardens in everyone’s backyards. We want to be really self-sufficient here,” she adds.

Kanaka Bar has also developed a youth program that teaches students to take care of the animals and maintain the food forest, which contains over 90 species of plants.

To learn more, watch [Power to the People Episode 2: Kanaka Bar](#).

### WHITE MOUNTAIN APACHE TRIBE HEALING THROUGH FOOD

Clayton Harvey from White Mountain Apache Tribe has been working with his community to restore their personal and cultural health by building a local farming system. Their first farm, [Ndée Bikíyaa \(The People’s Farm\)](#) provides healthy and high quality produce to community members, local schools, and other facilities. Clayton also runs educational and preventive care workshops to encourage healthy eating amongst the Apache Nation.

“When we first started this project, we talked about capitalism,” says Clayton. “We talked about how today’s society is based upon how much money you make. And our people never measured our



*Figure 58: Beekeeping in Kanaka Bar with Serena Michell (photo credit: Power to the People, Real World Media)*

<sup>268</sup>. Project Food Forest. (2016). What is a Food Forest?. <https://projectfoodforest.org/what-is-a-food-forest/>



standards that way. And now we are in a stage where we need to sustain the farm by increasing our production. So we decided to work with **Café Gazhóó** and sell a lot of our products in that store. Before this whole trend of eating organic came along, our ancestors built this complex food system of wild food that the Western Apache people ate. We didn't call it organic, it was just food."<sup>269</sup>

Nephi Craig is the person who recently launched Café Gozhóó, a restaurant and nutritional recovery clinic with the support of the Rainbow Treatment Center. Nephi is a chef and the founder of the Native American Culinary Association, a network of Native Cooks, chefs, scholars, farmers, and community members leading multiple initiatives to develop and preserve Native American foodways. He is a member of the White Mountain Apache and has been working tirelessly to restore Native American traditions through food.

Nephi also frequently holds workshops and events in collaboration with communities on how to use local ingredients from the landscape or grown by Apache farmers to cook nutritious and healthy meals. Café Gazhóó was formerly a gas station, until he and his team took over the location. The word Gazhóó is an Apache word that means beauty, harmony, love, and happiness. His vision is to “use the space to reconnect with the themes of ancestral knowledge, spirituality, prayer, time, and place in a healing way.”

“We are celebrating Apache foodways,” says Snephi, “in a kitchen that was built by Apaches for Apaches! So the café is a living example of food sovereignty in action.”<sup>270</sup>

Clayton is very conscious of the colonial food legacies in his community. He now recognizes that in many of the ceremonies, dances, and wakes held among the Apache, traditional foods have been replaced with unhealthy processed foods, including candy, sweets, and soda pop. This unhealthy diet can lead to a variety of health issues, including diabetes in children.

Food historian Ian Mosby, one of the earlier settlers in Canada to uncover and admit to the negative impacts of colonial food systems on Indigenous children, echoed the same concerns at the 2018 CORNvergence Gathering:

“While many of the efforts to combat obesity, diabetes and other diet-related chronic diseases and risks in Indigenous communities have focused on modifying individual behavior and have focused on education, there has been little or no recognition that these problems

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269. Sterlin Harjo (Producer), Tanya Mellier (Producer) & Sanjay Rawal (Director). (2021). Gather [Documentary]. <https://gather.film/>.

270. Ibid.

may in fact be the legacy of colonial policies like the residential school system."<sup>271</sup>

Engaging openly in such discussions at events like CORNvergence (held at the Six Nations Community Hall in Ohsweken, Ontario) is key to the meaningful celebration of Indigenous food and culture, and an important step towards decolonization.

For his part, Clayton is restoring Apache traditions and bringing hope to communities through his farming practices:

"We believe that through farming, and through reintroducing what's been lost, it will help [counter] our overwhelming rates of health disparities that our people are facing. And working at the farm has brought a lot of healing to my life. A lot of understanding, a lot of meaning to my life, and today I'm now prouder than any time in my life to say that I'm White Mountain Apache!"<sup>272</sup>

### **KANAKA BAR FIRST NATION, TSLEIL-WAUTUTH FIRST NATION, AND ALERT BAY FIRST NATION - EATING WILD**

Chief Patrick Michell, who noted that the return of all five migratory fish species to his community has been forecast as "bleak," shares the following:

"For 8000 years my ancestors lived off of the wild salmon. It's our resource, culture, history, and our governance structure. What defines Kanaka Bar is the salmon. Sockeye salmon spawning temp is 18 C. The river is already in excess of 20 C. Every year we see the run sizes diminishing, We are exerting more effort to catch less fish. Everything that defines me as a person depends on this resource and this resource is starting to dwindle. If the people of the salmon don't have salmon, who are we? The people of the salmon may have to become the people of the potato."<sup>273</sup>

Kanaka Bar has seen wild salmon populations shift from abundant to near extirpation the past few decades.<sup>274</sup>

The people of Kanaka Bar are not the only ones who subsist on and hold the salmon as sacred. From Listuguj, to Tsleil-Waututh, to Alert Bay, salmon, which are central to both culture and nutrition, are

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<sup>271</sup>.Ibid.

<sup>272</sup>.Ibid.

<sup>273</sup>.RealWorld Media. (2020). Power to the People. Episode 11: Taku River Tlingit. <https://www.apntv.ca/powertothepeople/video/season-1/>.

<sup>274</sup>.Chambers, K., D. Stanyer, and M. Hocking. (2021). State of the Fraser River at Kanaka Bar. Consultant's report prepared for Kanaka Bar Band by Ecofish Research Ltd. <https://www.kanakabarband.ca/files/ecofish-2021-07-12-2.pdf>





**Figure 59:** Fishing in Kanaka Bar (photo credit: Power to the People, Real World Media)

under attack due to human-instigated climate change in general and European-owned fish farms in particular.

“For thousands of years Tsleil-Wauhtuth people got over 90% of our diet from the inlet, and we never desecrated ecosystems. We never over hunted or fished,” says Charlene Aleck, councilor for Tsleil-Waututh First Nation. Today that very inlet, overrun by big oil tanker traffic, is at the center of the fight against the Trans Mountain Pipeline expansion.<sup>275</sup>



**Figure 60:** Protect Wild Salmon signs in Alert Bay to advocate against net fish farming (photo credit: Power to the People, Real World Media)

Chief Kwaknabalas of Alert Bay First Nation, also known as Ernest Alfred, has been leading the **fight against industrial fish farms** in his territory for years. Salmon farmers, primarily from Norway, have imposed Atlantic salmon fish farms along the pathways of the Chinook, sockeye, and other breeds of Pacific salmon. These fish farms create an ecosystem of disease, sea lice, and bloody water. The salmon in these farms are often found with large tumors and absent lower jaws - what's more, these unwelcome farmers tax the local ecology by using wild herring and anchovies to feed the poorly mistreated frankenfish.<sup>276</sup>

Chinook salmon are catching lice from these same farms, as well as

<sup>275</sup>.RealWorld Media. (2020). Power to the People. Episode 13: Gull Bay. APTN.

<https://www.aptnv.ca/powertothepeople/video/season-1/>.

<sup>276</sup>.RealWorld Media. (2020). Power to the People. Episode 5: Alert Bay. APTN.

<https://www.aptnv.ca/powertothepeople/video/season-1/>.

<sup>277</sup>. Polinski, M.P., Marty, G.D., Snyman, H.N. et al. (2019). Piscine orthoreovirus demonstrates high infectivity but low virulence in Atlantic salmon of Pacific Canada. Sci Rep 9, 3297. <https://doi.org/10.1038/s41598-019-40025-7>

<sup>278</sup>. Ibid.

<sup>279</sup>. Ibid.



being killed by Piscine orthoreovirus, an infectious and transmissible disease found in farmed salmon.<sup>277</sup> As a result, the southern resident orca population is being destroyed due to a lack of wild salmon.

Those who have dove into the waters in and around fish farms have horrifying stories to tell about the health and wellbeing of ocean life. Dr. David Suzuki described his experience of scuba diving under one of these salmon prisons and seeing a bottomless pit of feces and pellets.<sup>278</sup>

In 2018, for the first time in history, Alert Bay First Nation was able to count the number of fish that returned (only fourteen). This is in stark contrast to the hundreds of thousands of fish that used to return to their waters every year. Prior to the age of climate change and destructive corporate capitalism, this was in no way the reality of Indigenous Nations who survived and thrived off of the wild salmon populations.<sup>279</sup>

### **YUROK TRIBE, SAN CARLOS APACHE TRIBE, WHITE MOUNTAIN APACHE TRIBE, YAVAPAI TRIBE, AND GULL BAY FIRST NATION - RESTORATIVE REVOLUTION**

Samuel Gensaw is a member of the Yurok Tribe and a co-founder of the **Ancestral Garden**. His work ranges from international environmental advocacy to restoring traditional ecological knowledge in his community. Samuel and his team at the Ancestral Garden help connect youth to the Klamath River by organizing canoe building workshops and fishing gatherings. He shares his thoughts about the importance of restoring balance to the river, and, by extension, to his community:

“We’re fishermen, and once the salmon are gone, it’s the end of the world for us, and there’s no going back. We know that the salmon run is directly connected to the health of our community. If you have a bad fishing season, then there is a rise in drug abuse, and there is a rise in suicides. Because when you come home empty-handed, there’s a sadness that starts to set in, and that’s depression. Our grandparents weren’t allowed to fish. They had to cover their tracks. When you fished, you had to do it



Figure 61: Signs in support of the occupation of Swanson Fish Farm (photo credit: Power to the People, Real World Media)

secretly. Our ancestors went to war with the government, right here on the same grounds to protect our fishing rights, and to protect this river. And today, if you are youth, you have a higher chance of accessing drugs than being able to buy affordable, healthy food. So we started the Ancestral Garden, a non-profit youth group. Our goal is to just bring balance back to relationships between our people and our river.”<sup>280</sup>

**Twila Cassadore** is a traditional harvester and has been working with the San Carlos Apache, White Mountain Apache, and Yavapai Peoples for the past 25 years to integrate traditional knowledge from the Elders back into the communities, to better address health and social issues.

“I’m a traditional harvester. I like to forage food,” says Twila, who often collaborates with other community members to hold workshops for the youth about their local landscape and the food grown naturally in the region. “When you are out there walking, you get to hear the birds. Sometimes you get to know the stories about the place, where these plants grew or how they were used. But when you’re out there, actually looking for something, you open a whole part of your mind to something else. You’re open to the air, the sun, the weather, the rain. And it’s just beautiful.”<sup>281</sup>

Whether it’s pickerel, salmon, or wild rice, Indigenous Peoples across Turtle Island long lived in balance with the surrounding natural world. “That’s our grocery store,” says Aj Esquega, Mashkawiziiwin of Energy Projects at Gull Bay First Nation, referring to the Gull River.<sup>282</sup>

“This knowledge that has been passed down for thousands of years by our ancestors can be accessed and it can be applied to your daily life,” says Samuel Genshaw. “No matter where you are, no matter where you’re from. Because the industrial revolution is over. Now if we want to survive, if we want to carry on life on Earth, we need to be a part of the restorative revolution. And whatever that looks like to you, just make sure you get your hours in.”<sup>283</sup>

“It’s this movement among all Indigenous People that they’re finally listening, they are feeling this,” says Twila. “They hear it and it’s like music, when you hear the drums calling you. And I feel that from all different cultures, they hear the same drums. And it’s Mother Earth...and Mother Earth’s heart is beating and she is talking to all of us, [telling us] that we need to do something.”<sup>284</sup>

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280. Sterlin Harjo (Producer), Tanya Mellier (Producer) & Sanjay Rawal (Director). (2021). Gather [Documentary]. <https://gather.film/>.

281. Ibid.

282. RealWorld Media. (2020). Power to the People. Episode 13: Gull Bay. APTN. <https://www.apntv.ca/power-to-the-people/video/season-1/>.

283. Sterlin Harjo (Producer), Tanya Mellier (Producer) & Sanjay Rawal (Director). (2021). Gather [Documentary]. <https://gather.film/>.

284. Ibid.



Figure 62: Sustainable Housing in Bella Coola (photo credit: Power to the People, Real World Media)

## 5.3 ECO-HOUSING

*"To maintain your home you have to look after it, and I say look after it like it's a human being, and it'll have a better life expectancy."*

**RICHARD HALL**  
Nuxalk Nation

Renewable energy is not the only way to create solutions for communities. **"Eco-Housing"** strategies involve building and operating environmentally low-impact buildings that are sustainable, minimize greenhouse gas emissions, meet efficiency standards, and reduce energy needs.<sup>268</sup> For example, homes may be built with environmentally-friendly materials, equipped with solar panels, or use energy and water conserving technologies.

These technologies and building materials can also be used to build healthy, liveable homes that suit the social, cultural, and economic needs of communities, as well as the environments in which they are situated.

For more information on energy efficiency and energy conservation, see section 2.3.

268. Oxford Reference. (2021). Ecohouse. <https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095740963>.



*Figure 63: New housing similar to Big Houses in Bella Coola (photo credit: Power to the People, Real World Media)*

## **WISDOM FROM COMMUNITIES**

### **NUXALK FIRST NATION SUSTAINABLE HOUSING AND COMMUNITY BUILDINGS**

Nuxalk Nation First Nation, located in Bella Coola, British Columbia, is in the process of building sustainable housing and other sustainable buildings throughout their community.

“The original issue that I found was that houses weren’t designed to withstand the elements. Those houses were built for a climate that’s a lot hotter and drier than here,” says Jalissa Moody, a Nuxalk woman who served as assistant asset manager for the Nation.

Bella Coola gets at least 1.65 meters of rain per year at speeds of up to 100 miles per hour, leaving many aging homes moldy and unlivable.

The Nation is currently repatriating the land from an old motel site and building a new, larger hotel that will be equipped with high efficiency standards that better suit the community’s needs.

A restaurant and new education and administration facility are also being built with mold resistant drywall, waterproof vinyl flooring, and triple paned glass, which provides quality insulation through extremely cold winters, while also keeping the buildings cool through hot summers. The education and administration facility will be located next to the school, band office, and other essential services. The Nation is also building a store and café to offer more places for the community to shop and gather.

Brandon Jeffrey, who specializes in finishing carpentry for Nuxalk, says, “We’re trying to be more self-sufficient and get the lumber from our own mills. Nothing beats it, you get to go home, see the wife, the kids, come back and do it again. It’s good to keep building the community, it’s what we’re here for.”

The community’s new triplex units are designed for young families and come with storage facilities, which also act as a fire separation and sound barrier, giving each family additional space and making each home feel more private. According to Richard Hall, Nuxalk Nation’s asset manager and overseer of construction projects, in addition to efficiency standards which “exceed and supersede the building code,” these new homes are also championing a Nuxalk cultural tradition that Jalissa describes as “bringing in those natural elements that we are surrounded by into our daily lives.” Each new building the Nation constructs is easily recognized by its signature cedar trim, an acknowledgement of the sacred relationship the Nuxalk have had with cedar since time immemorial.

The community has also built larger family homes which they call Big Houses, in honour of the Big Houses their ancestors built with cedar planks, which were big enough for multiple families.<sup>286,287</sup> “We’re getting back to our roots and utilizing all the brilliant and intelligent people we have within our Nation,” says Jalissa.

“With our new housing plan,” adds Richard, “we’re creating our own siding and utilizing more practical and durable products. It costs more, but guess what? It promotes a better life expectancy.” The new homes employ radiant floor heating, which moves hot water through pipes underneath the floor to keep residents warm through cold and wet seasons.<sup>288</sup>

Vance Snow, a Nuxalk community member who previously lived in a duplex, says, “I never thought I’d have a house and I didn’t see any housing coming for a long time. Then all of a sudden, bang, it’s here!” Holding back tears he adds, “For me and my daughter, it’s one of the best feelings of my life. The community is a loving place. I raise my hands up to them all, for helping us to get homes like this.”

The challenges community members face - along with histories that haunt present day dreams - feel insurmountable at times. Richard, now in charge of a staff of 53 workers, recalls the difficult road that brought him to where he is today.

**[TRIGGER WARNING: residential schools]:**

“I lost my father when I was two years old,” shares Richard. “I was raised by my grandfather and grandmother. When I was eleven years old I was taken away and put into residential schools. I was beaten. I was abused sexually. I was in survival mode. Then finally one day I realized ‘Life is not supposed to be like this,’ so I tapped out and said ‘I gotta stop drinking and start looking for a new insight.’ I said ‘teach me again who I am.’”

Richard went back to school after working in carpentry, and became a housing inspector, during which time he visited over 150 communities. “I saw what was put in place for them,” he says. “The federal government never really supported the trades. That’s one of the challenges I have. I have to get them to

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286. Canadian Museum of History. (N.d). Grand Hall Tour.

<https://www.historymuseum.ca/cmhc/exhibitions/aborig/grand/ghhe6eng.html>.

287. Vancouver Heritage Foundation. (N.d). Traditional Coast Salish Plank Houses.

<https://www.vancouverheritagefoundation.org/house-styles/traditional-coast-salish-plank-houses/>.

288. Office of Energy Efficiency & Renewable Energy. (N.d). Radiant Heating. U.S. Department of Energy.

<https://www.energy.gov/energysaver/radiant-heating>.



support the trades so First Nations can build their own houses to suit their social, cultural, and economic needs. And that's what I'm doing here. With the trades program, we can connect the children to the parents to the home again (and help heal the disconnect created by residential schools)."

To learn more, watch [Power to the People Episode 9: Bella Coola](#).

### **SNUNEYMUXW FIRST NATION INDIGENOUS CONSTRUCTION PROGRAM**

Working with Vancouver Island University (VIU), the Snuneymuxw (Nanaimo) First Nation created an [Indigenous Aboriginal Construction Program](#).<sup>289</sup>

"This program came available through dialogue with the University, our communities, and industry," says Chief Michael J. Wyse. "We've come together with our neighboring communities to partner and bring our young people forward." Although Snuneymuxw is still facing a housing crisis, Chief Michael shares, "When it comes time that we are ready to build new homes, then we have the people ready and available."

Cameron Frenette, who teaches Indigenous students how to build houses, shares:

"We have ten students from various nations from the island, they come in with next to no experience, but by the time they leave the program they are at a level one carpentry apprenticeship. We talk about, 'How can you bring these skills back to your community? What can you do for yourself and the youth in your community? How can you be a role model?' Everyone grows up with role models, but if you could actually grow up and be one yourself, it's a pretty cool thing and a lot of these students have that chance; they can give back to their communities financially, help their neighbors, and they can work on their own house."

Christopher Brown, a student at VIU and a member of Snuneymuxw Nation, recalls, "When I was younger, our community needed people to help and there weren't Aboriginals like us to step forward to build the community up. That's what I want to do."

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<sup>289</sup>Vancouver Island University. (N.d). Programs and Courses: Aboriginal Construction.  
<https://www.viu.ca/programs/trades-applied-technology/aboriginal-construction>.

## **NUXALK FIRST NATION SOLARIZED TINY HOUSE PROJECT**

“Back in 2016 I was taking housing applications and could see there was a wide range of applicants, but I could also see that our housing stock was geared more towards families,” shares Jalissa Moody. “Of course this makes sense, but it doesn’t take into account all of our people, and as Nuxalk people we want to provide for our entire community. We learned fairly quickly that there were not a lot of housing options for single men, especially those who are struggling with trauma and addiction,” she says. “Many of these men were homeless in the sense that they didn’t have a permanent roof over their heads, they were sleeping in their cars, they were couch surfing.”<sup>290</sup>

Wayne Schooner, 67, cannot remember the last time he had his own home. “Last fall when I was sleeping in my car I woke up to a big grizzly bear staring in my window. That gave me a scare,”<sup>291</sup> he says. He now lives in one of the community’s solarized tiny homes.

The tiny homes were built by members of the Nation trained in the carpentry program at Nuxalk College, and solarized by Hakai Energy Solutions. Each home generates most of its power from solar, but is “hooked into the grid to ensure they aren’t left in the cold if the panels aren’t enough on cloudy days,” says Jalissa. As her Nation’s asset manager, she has also prioritized finding local materials and fixtures for each home because, as she puts it, “it’s important to us to keep the money circulating here.”<sup>292</sup>

Keeping the money “here” also means that each building is designed, constructed, and now inhabited by members of the community. By sourcing tenants from the community who are working to develop a holistic approach to health and lifestyle, Nuxalk Nation has created an unprecedented partnership between its housing and wellness departments.

“Giving them a home is the first step, and then from there it will blossom,” says Jalissa.

Upon seeing these homes, Melina Laboucan-Massimo comments, “In the past, buildings haven’t been up to par or conducive to creating inspiration in our communities, so I think the fact that we now have a new generation of Indigenous builders to create inspiring buildings for our Nations is a first step toward really helping our communities heal. I’m leaving this community inspired.”

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<sup>290</sup>.Thompson, Caitlin. (2019). First Residents Move into Nuxalk Nation’s Tiny Homes in Bella Coola. Quesnel Cariboo Observer. <https://www.quesnelobserver.com/news/first-residents-move-into-nuxalk-nations-tiny-homes-in-bella-coola/>.

<sup>291</sup>.Ibid.

<sup>292</sup>.Ibid.





**Figure 64:** Solarized tiny homes in Bella Coola (photo credit: Power to the People, Real World Media)

### SECWPEPMC NATION TINY HOUSE WARRIORS ASSERTING INDIGENOUS SOVEREIGNTY AND ENERGY INDEPENDENCE

Renewable energy allows communities to have control over their power, protect the climate, and assert their **Indigenous rights and sovereignty**. The **Tiny House Warriors** from the Secwepemc Nation are building solar-powered tiny houses along the 518 km Kinder Morgan Trans Mountain pipeline route, which runs through their unceded territory.<sup>293</sup> In doing so, they are asserting their Indigenous rights and title, reestablishing village sites, providing homes to Secwepemc families facing a housing crisis, and working to stop an oil sands pipeline.<sup>294</sup> In 2017-2018, Sacred Earth Solar built 2 solar PV projects to provide off-grid energy to the Tiny House Warriors.



**Figure 65:** Solarizing tiny homes with the Tiny House Warriors (photo credit: Zack Embree)

### LISTUGUJ FIRST NATION IMPLEMENTING INDIGENOUS LAW

Despite the fact that the government of Canada has initiated a process of “reconciliation,” Indigenous People still face the same racist and extractive policies that have plagued our land, water, air, and bodies for the past 150 years. One clear advantage of renewable energy projects is the increased ability of communities to take matters into their own hands: living by natural law while also generating revenue that can help reestablish culture which was almost destroyed is a win-win.

293. Tiny House Warriors. (N.d). Tiny House Warriors - Our Land is Home. <http://www.tinyhousewarriors.com/#about>.

294. Laboucan-Massimo, Melina. (2018). Is there anything these Secwepemc solar powered tiny houses can't do?. David Suzuki Foundation. <https://davidsuzuki.org/story/can-solar-powered-tiny-houses-stop-a-pipeline/>.



“[We are] reclaiming what we never gave up in the first place,” says Scott Metallic of Listuguj First Nation, whose wind farm is generating significant revenue for his community. “We need future generations to enjoy this, that’s why we put the work in it now.”

### **TAKU RIVER TLINGIT HARNESSING NATURAL LAW FOR COMMUNITY SUSTAINABILITY**

A similar sentiment was echoed by Peter Kirby, CEO of Taku River Tlingit Group of Companies. “We have an opportunity to influence what happens, not only in our community, but around our community. And if I can fast forward into the future, I see that our community can potentially have economic sovereignty.”

“The colonial systems that have been set up for us are set up for failure,” says K’eduka Jack, who works on natural law and language revitalization for the Taku River Tlingit. “Tlingit law is the way one lives their life everyday. Live your life in this good way. Be respectful. Take care of everyone who is here, whether they are visiting for an hour or their entire lives. Practice reciprocity.”

Being 100% off diesel fuel and having a living water system that is so healthy one can drink from it directly, Taku River Tlingit is an incredible example of a community living their true values.

The Taku River Tlingit are harnessing their natural laws to develop educational and capacity-building tools for their community, as well as strategies that will help them assert their inherent rights to the land. “It can be very difficult to look at your life and think that you’ll never truly understand what your ancestors felt. The clean energy project that we have happening in the Nation is focused on coming back from that trauma,” adds K’eduka.

### **TSLEIL-WAUTUTH NATION REVITALIZING INDIGENOUS LAW FOR LAND, AIR AND WATER**

Tsleil-Waututh Nation is part of a collective called **RELAW**, an acronym for “Revitalizing Indigenous Law for Land, Air and Water.”

“We work directly with and for Indigenous communities to express and apply their own unextinguished Indigenous laws to contemporary situations,” says Eugene Kung, a lawyer with West Coast Environmental Law. They, along with many other Nations not necessarily affiliated with the collective, are “trying to change Canadian law, so that it can reflect justice, equality, and fairness,” says Eugene.





**Figure 66:** Melina with members of RELAW: “Revitalizing Indigenous Law for Land, Air and Water.” (photo credit: Power to the People, Real World Media)

When one flies into Vancouver International, the airport is full of Coast Salish art, seeming to signify - to visitors and settlers alike - that they have arrived in a post-colonial society that has reconciled with its violent past. Getting the government to commit to more than lip service, however, can be a difficult task.

“Canadian Law recognizes the existence of Indigenous Law, but the government has continued to view Aboriginal rights and the consultation framework as a burden rather than a duty. That’s really at the core of what meaningful reconciliation will look like, is how we can navigate these two systems,” says Eugene who, on behalf of all the Nations in RELAW, is lead legal counsel on the fight against the Trans Mountain Pipeline.

When the gargantuan oil tankers traverse the Second Narrows bridge in Vancouver, they only have a meter and half of clearance at high tide. This puts everyone at risk, including the endangered orca and salmon populations. And oil spills are also not without precedent.

There are approximately 14.8 major oil spills each year, recalls Charlene Aleck, Councillor for Tsleil-Waututh Nation. “When my mom was a kid, there was a spill. Everyone had a big silver tub in their yard, and the kids would have to wash the oil off,” she says.

Approximately 706 million gallons of waste oil (not counting oil “spills”) enter the ocean **every year**.



## POLICY FOR A “JUST” TRANSITION

Together, political support and strong energy policy can shift us toward a renewable energy future. Ultimately however, our energy landscape and policies need to undergo deep systemic change - addressing the climate crisis and achieving a Just Transition will require solutions rooted in Indigenous self-determination, the full and meaningful inclusion of Indigenous Peoples, and the upholding of our rights, knowledges, sovereignty, and leadership.

Indigenous Peoples across Turtle Island are already leading the way towards a Just Transition - within both Indigenous and colonial governance structures. We interviewed many of these communities for this Guide. In the following sections, we outline some of the policy successes and challenges communities have encountered throughout the different stages of their renewable energy projects, as well as their recommendations for policymakers moving forward.



## 6.1

# CANADA'S ENERGY POLICY LANDSCAPE

As a part of the Paris Agreement, Canada pledged to reduce its emissions 30% (from 2005 levels) by 2030, and 80% by 2050.<sup>295</sup> But with projected oil sands expansions and emissions scheduled to hit 115 megatonnes by 2030, meeting these climate targets will be nearly impossible.<sup>296</sup> Given the current status of so-called Canada's energy production, use, and exports, massive policy shifts will be needed if there is any hope of meeting these targets and achieving a just and equitable energy transition.

Across the country, climate and energy policy vary significantly from province to province. The Pembina Institute provides an outline of a number of provincial and territorial policies relating to clean energy (as of 2021) in their report, **Power Shift in Remote Indigenous Communities**. To stay up to date with Canadian provincial, territorial, and federal energy policy, you can also refer to the **International Energy Agency's Policy Database**.

In so-called Canada, the main federal frameworks include *A Healthy Environment and a Healthy Economy* (HEHE), which came out in 2020, and *Pan-Canadian Framework on Clean Growth and Climate Change* (PCF), from 2016.<sup>297</sup> According to the Canadian government, the PCF was developed to help achieve its Paris Agreement target, while the HEHE builds on PCF efforts to cut pollution, create employment, and support a healthier economy and environment.<sup>298</sup> However, as shown in ICA's **Decolonizing Climate Policy in Canada** report, both of these frameworks have allowed for further extraction of fossil fuels, and neither have meaningfully included or valued Indigenous people and their contributions to climate solutions.<sup>299</sup>

The lessons of the guide highlight the notable gaps in the federal government's current approach to a Just Transition, including Bill C-50, the Canadian Sustainable Jobs Act, which just passed second reading in parliament in October 2023.

The Sustainable Jobs framing chosen by the government is narrowly focused on solely jobs and does not include the need for entire communities, municipalities, and provinces to transition, missing the opportunity to solve much more than our climate problems. The principles and strategies of the Just Transition extends beyond our energy systems, as we also advocate for just relationships with one another and with the natural world.

To effectively move towards a Just Transition, policies and solutions must center and uplift those most impacted by the climate crisis. We cannot rely on systems that are deeply rooted in colonized practices while excluding Indigenous voices from the decision-making table. We need Just Transition policies that

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295. Government of Canada. (2021). Progress Towards Canada's Greenhouse Gas Emissions Reduction Target. <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/progress-towards-canada-greenhouse-gas-emissions-reduction-target.html>.

296. Wilt, James. (2018). 10 Handy Facts About Canadian Energy That You Actually Probably Want to Know. The Narwhal. <https://thenarwhal.ca/10-handy-facts-about-canadian-energy-you-actually-probably-want-know/>.

297. Government of Canada. (2021). What's in Canada's Climate Plan. <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview.html>.

298. Ibid

299. Indigenous Climate Action. (2021). Decolonizing Climate Policy in Canada: Report from Phase One. Indigenous Climate Action. [https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf\\_critique\\_FINAL.pdf](https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf_critique_FINAL.pdf).

are both responsive to the current socio-environmental issues that we face (“reactive” policy), while also providing substantial support for clean energy and a new path forward (“proactive” policy). While “reactive” efforts minimize the costs to affected workers and communities moving away from fossil fuels, “proactive” efforts are necessary to shift us towards clean energy before climate crisis impacts and social inequalities worsen.<sup>300</sup>

Aside from equity and sustainability as motivating factors for taking a proactive approach, it also just makes more sense economically. Dylan Heerema, a Senior Policy Analyst at **Ecotrust Canada**, emphasizes the cost of delaying action:

“We are in a new reality. We are in a reality of wildfire and poor air quality and extreme heat and extreme weather events. There is a cost to that - one way or another - to government. Government can either be proactive about that cost or it can be reactive and ultimately cripple the economy trying to respond to crises if people are still in these terrible situations. [...] It’s actually so much cheaper if we just take bold action and provide meaningful, targeted support to the people that actually need it.”<sup>301</sup>

When thinking about our responses to climate change, Chief Patrick Michell of Kanaka Bar First Nation implores us to think critically:

“Choose wisely. Make good choices. Do you want to be in a reactive model? Or do we want to be in a proactive mode - where you’re ready with awareness, with data, with mitigation and adaptation, with a plan, with ample on-the-ground effort?”

## 6.2

## RENEWABLE ENERGY CHALLENGES

There are a number of obstacles to overcome in achieving a Just Transition. This section describes the challenges and barriers that many Indigenous communities face in the renewable energy sector - many of which require substantial changes to our current energy policy.

### POLICY JURISDICTION

The question of jurisdiction remains a central problem for energy policy - leaving many policies and programs “piecemeal and segregated across most jurisdictions.”<sup>303</sup> Although the tone can be set by the federal government, on-the-ground energy policy is determined by each provincial or territorial

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**300.** Mertins-Kirkwood, Hadrian, and Z. Deshpande. (2019). Who Is Included in a Just Transition? Considering Social Equity in Canada’s Shift to a Zero-Carbon Economy. Canadian Centre for Policy Alternatives. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition\\_final.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition_final.pdf).

**301.** Heerema, Dylan. (2021). Ecotrust Canada. Personal communication regarding just transition policy.

**302.** Michell, Patrick. (2021). Kanaka Bar First Nation. Personal communication regarding just transition policy and Kanaka Bar.

**303.** Qitoras, Marvin. (2021). How to boost renewable energy integration in remote communities. Pembina Institute. <https://www.pembina.org/blog/how-boost-renewable-energy-integration-remote-communities>



government. And yet the provincial, territorial, and federal governments alike remain hesitant to take on leadership or responsibility for responses to the climate crisis in general and energy policy in particular. At the same time, they have not allowed Indigenous communities to exercise authority over their own energy systems. Dylan Heerema echoed these sentiments:

“The Federal Government is so risk averse - I feel like that’s been a major failing. They’re happy to set targets but very, very leery of getting to the question of provincial jurisdiction around energy. I think that their motivations are political and ultimately that’s a risk that they’re not willing to take for the sake of remote communities, which is a reality of politics that is really unfortunate and really colonial. [...] Rather than framing it as the federal government needs to step up and assert authority and jurisdiction, I think that the answer is actually to further devolve authority to communities. It’s really the provincial governments that need to let go of that control.”<sup>304</sup>

## POLICY DEVELOPMENT AND PROGRAM DESIGN

Steps are being taken to advance Indigenous climate leadership, however the Canadian government has a long way to go toward substantive change. Although governments repeatedly state their intentions to work in partnership with Indigenous Nations, these words have thus far not translated to action - Indigenous Peoples continue to be structurally excluded from climate policy development in so-called Canada.<sup>305</sup>

According to Valine Brown, a Haida Nation citizen and co-founder of Swiilawiid Sustainability Society, “Any climate policies that BC has developed are grossly inadequate. They don’t incorporate Indigenous leadership, wisdom or solutions, they don’t acknowledge our sovereignty or authority - in any way on paper, nor in any kind of practice. That is a major gap and loss in what climate policies exist within what is called British Columbia.”<sup>306</sup>

There is also a lack of baseline progressive policy to move us towards a Just Transition. For example, there are currently no government policies in place that incentivize upgrading inefficient generators, installing energy efficient technologies, or fuel switching.<sup>307</sup> Many of the remote Indigenous communities that rely

304. Heerema, Dylan. (2021). Ecotrust Canada. Personal communication regarding just transition policy.

305. Indigenous Climate Action. (2021). Decolonizing Climate Policy in Canada: Report from Phase One. Indigenous Climate Action. [https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf\\_critique\\_FINAL.pdf](https://static1.squarespace.com/static/5e8e4b5ae8628564ab4bc44c/t/6061cb5926611066ba64a953/1617021791071/pcf_critique_FINAL.pdf).

306. Brown, Valine. Haida Nation. (2021). Personal communication regarding just transition policy, Haida Nation, and Swiilawiid Sustainability Society.

307. He, Emily. (2021). “Reducing emissions from diesel generators in remote communities”. Pembina Institute. <https://www.pembina.org/pub/reducing-emissions-diesel-generators-remote-communities>.

on diesel energy generation are exempt from existing climate and energy policies designed to improve the sustainability of energy systems, such as carbon pricing.<sup>308</sup> These policy exemptions economically favour the continued use of diesel, making the transition to clean energy even more challenging in Indigenous communities. Although so-called Canada has created several funding programs for renewable energy programs in remote communities, more needs to be done to support diesel decarbonization and reduce our reliance on fossil fuels.

Unsurprisingly, Indigenous communities in the process of transitioning to renewable energy often face significant barriers in the financing of required infrastructure. Renewable energy projects have high capital costs, require specialized skill sets, and are more difficult to construct in remote communities.<sup>309</sup>

Peter Kirby of the Taku River Tlingit First Nation has pointed out that many funding opportunities geared towards reconciliation with Indigenous communities nonetheless fail to provide unique or additional benefits beyond what non-Indigenous-led projects receive. This demonstrates a need for more equity-based, targeted funding programs that meaningfully account for generations of unequal treatment towards Indigenous Peoples.

“It’s the same contract that anyone else would get,” Peter says, “so where’s this benefit that’s accruing to First Nations? While there is benefit to getting a grant or getting a contract, it is only what would be provided to anyone undertaking the project, there is nothing additional to or for First Nations, so if one looks at two entities and sees a grant or contract provided to each of them, they would see the exact same grant or contract. So where is the “First Nations benefit” beyond what would be a benefit to any recipient?”<sup>310</sup>

## FOSSIL FUEL LOBBYING

In the energy sector, lobbying can impact major environmental assessment acts, national energy strategies, pipelines and consultation processes with Indigenous communities.<sup>311</sup>

Federal energy policy currently caters to the needs and interests of the fossil fuel industry.<sup>312</sup> A Canadian Centre for Policy Alternatives (CCPA) report confirmed that lobbying in so-called Canada is concentrated among large fossil fuel firms and key industry associations.<sup>313</sup> Lobbying is intended to influence policy decisions - however, that influence is dominated by wealthy and corporate interests, away from public view.<sup>314</sup> The strategic and sustained lobbying efforts of the fossil fuel sector exerts pressure on

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308. Ibid.


309. Qitoras, Marvin. (2021). “Better government policies will unlock the cash remote Indigenous communities need for clean energy.” Pembina Institute. <https://www.pembina.org/blog/better-government-policies-will-unlock-cash-remote-indigenous-communities-need-clean-energy>.

310. Kirby, Peter. (2021). Taku River Tlingit First Nation. Personal communication regarding just transition policy and Taku River Tlingit First Nation.

311. Ibid

312. Graham, Nicolas; Carroll, William K.; and Chen, David. (2019). Big Oil’s Political Reach - Mapping Fossil Fuel Lobbying from Harper to Trudeau. Canadian Centre for Policy Alternatives. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office%2C%20Saskatchewan%20Office/2019/11/ccpa-bc\\_cmp\\_BigOil\\_web.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office%2C%20Saskatchewan%20Office/2019/11/ccpa-bc_cmp_BigOil_web.pdf).

313. Ibid.



decision-makers to develop policy in alignment with their interests, which presents a considerable barrier to the success of renewable energy.<sup>315</sup>

The CCPA reports that the fossil fuel industry recorded 11,452 lobbying contacts with government officials from 2011-2018.<sup>316</sup> The fossil fuel industry is given a distinct advantage due to their significant financial resources and influence - this influence outlasts election cycles and undermines meaningful consultation with Indigenous Peoples.<sup>317</sup>

## **BARRIERS TO GRID ACCESS FOR INDEPENDENT POWER PRODUCERS (IPPS)**

Indigenous communities should be empowered and incentivized to generate their own energy, yet utility companies have made this process difficult by restricting grid access. A prime example is the provincial electric utility provider, BC Hydro, which stopped providing contracts to IPPs because of their expected energy surplus from the Site C Dam.<sup>318</sup> This actively disincentivizes communities from joining the grid and generating their own renewable energy.

“We have all these projects that are being built or are ready to be built, but those projects only have one customer and that customer is BC Hydro. With the decision to proceed with Site C, BC Hydro became our biggest competitor,” says Isabelle Deguise, engineer and project manager with **BluEarth Renewables** (a non-Indigenous clean energy partner of both Sechelt and Squamish First Nations).

## **UTILITY-REGULATOR PROFIT MODEL**

In our current energy system, large utility companies are guaranteed a profit for projects that develop via Power Purchase Agreements (PPAs) - project costs are passed onto consumers, while regulators allow utilities to generate a steady long-term profit on the capital investment made. This is not true of community-led renewable energy projects, where the utility is only able to charge for transmission and distribution and does not reap a profit. The current utility and regulator model incentivizes big utility-owned capital projects and disincentivizes community-led renewable projects. As utilities and regulators have no real incentive to change their business model, it will take significant political pressure to effect the changes needed to move us all toward a more economic, more distributed, and more just energy transition.

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<sup>315</sup>. Ibid.

<sup>316</sup>. Ibid.

<sup>317</sup>. Ibid.

<sup>318</sup>. Government of British Columbia. (2019). Standing Offer Program – Results. <https://engage.gov.bc.ca/govtogetherbc/impact/standing-offer-program-results/#:~:text=The%20BC%20Hydro%20Standing%20Offer,small-scale%20renewable%20energy%20projects.&text=Suspending%20the%20SOP%20will%20reduce,rates%20for%20all%20British%20Columbians>.



## ENERGY PRICING

Negotiations on “fair” Power Purchase Agreement (PPA) rates are one of the most challenging and time consuming aspects of renewable energy project development, particularly because there is a lack of clarity on what the term “fair” constitutes.<sup>319</sup>

To complicate matters further, non-renewable energy prices fail to reflect the true costs of fossil fuels, which are heavily subsidized and which fail to account for the negative impacts of fuel production and consumption - otherwise known as “negative externalities.”<sup>320</sup>

Dylan Heerema noted the importance of adequate pricing for fossil fuels. “It’s so much more than the cost of the fuel - it’s the cost of maintaining the infrastructure, it’s the cost of the transport, it’s the cost of the air pollution, it’s the cost of the noise pollution, it’s the cost of being reliant on something that has to come up by barge or by winter road that if you don’t get that delivery you don’t get heat and light.”<sup>321</sup>

With accurate pricing, there is less of an incentive to continue exploiting the land for the production and consumption of fossil fuels, and more of an incentive to adequately fund renewable energy projects.

## WORKING IN REMOTE COMMUNITIES

Even when conditions are suitable overall, building a renewable energy project in a remote community is challenging. Transporting large equipment to the site, gathering the right tools, and having materials shipped from hundreds of kilometres away can significantly drive up project costs. Remote locations may also have less local expertise, which necessitates the hiring of off-site contractors - again, increasing project costs.

In light of her own experience building a solar project in northern Alberta, Melina Laboucan-Massimo offers advice to would-be renewable energy planners: “Ensure that you’re working with legit solar installers and master electricians so that your application is approved to connect to the grid!”

Peter Kirby of the Taku River Tlingit Group of Companies speaks to the difficulty of offering people incentives to work in remote communities rather than urban centres. “The more remote, the more challenging [to build] capacity. Both internally, within the First Nation, and ability to hire expertise from outside. [...] This is the challenge and why it is so important to build the capacity as local as you can. People who want to be there.”

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<sup>319</sup>. Fitzgerald, Eryn and Dave Lovekin. (2018). “Renewable Energy Partnerships and Project Economics: Research Supporting Indigenous–Utility Partnerships and Power Purchase Agreements”. Pembina Institute.

<https://www.pembina.org/reports/re-partnerships-and-project-economics.pdf>.

<sup>320</sup>. Ibid.

<sup>321</sup>. Heerema, Dylan. (2021). Ecotrust Canada. Personal communication regarding just transition policy.



## RELATIONSHIPS WITH UTILITY COMPANIES

Indigenous communities' distrust in big utilities and their resulting poor relationships with these companies present significant barriers to the development of renewable energy partnerships. Researchers at the Pembina Institute explain that this lack of trust is rooted in the historical and ongoing impacts of colonialism, which continue to disadvantage Indigenous communities today.<sup>322</sup> Unequal power relations are common, as utilities have a comparatively large amount of political, financial, and organizational power.<sup>323</sup>

Valine Brown of the Haida Nation speaks to the difficulties of working with provincial utility companies:

“They have all these barriers, they tell us what we can and can’t do, they tell us what is possible or not possible on Haida Gwaii. That severely limits the dialogue and work and it takes us away from the responsibility we have as humans, and as Haida who are living here on our lands and our waters, and how we meaningfully uphold our laws and our ways of being.”<sup>324</sup>

## TRANSITIONING FOSSIL FUEL WORKERS TO THE RENEWABLE ENERGY SECTOR

Many oil and gas workers want a Just Transition. **Iron and Earth** is a worker-led organization that aims to empower fossil fuel industry and Indigenous workers to build and implement climate solutions.<sup>325</sup> They commissioned a study of 300 Canadian residents working in the oil, gas, or coal sectors in 2021 and found that 69% of workers are interested in switching to careers in the net-zero economy.<sup>326</sup> They also found that 88% of fossil fuel industry workers are interested in skills training and development for jobs in the net-zero economy. These findings heavily emphasize the central need for retraining initiatives to ensure that workers and communities are properly supported as they make the transition to clean energy.

One example of Just Transition policy development is the Canadian government's coal phaseout and its associated task force, “Just and

322. Ibid.

323. Ibid.

324. Brown, Valine. Haida Nation. (2021). Personal communication regarding just transition policy, Haida Nation, and Swilawiid Sustainability Society.

325. Abacus Data, Iron and Earth. (2021). Climate Emergency Polling and Transition to Renewable Sources with Oil and Gas Sector Workers. [https://d3n8a8pro7vhmx.cloudfront.net/ironandearth/pages/1668/attachments/original/1626802948/Iron\\_\\_\\_Earth\\_-\\_May\\_2021\\_-\\_Presentation\\_Updated.pdf?1626802948](https://d3n8a8pro7vhmx.cloudfront.net/ironandearth/pages/1668/attachments/original/1626802948/Iron___Earth_-_May_2021_-_Presentation_Updated.pdf?1626802948).

326. Ibid.

Fair Transition for Canadian Coal Power Workers and Communities.”<sup>327</sup> But a **CCPA report** found that despite being portrayed as a “Just Transition,” the country’s coal phaseout policies primarily benefited Canadian-born white men. These benefits are not shared equally with socially and economically marginalized groups, such as Indigenous Peoples and other racialized identities.<sup>328</sup> The CCPA report also indicated that an absence of social policies that promote diversity and inclusivity in the growth of green industries will again primarily benefit Canadian-born white men at the expense of marginalized groups.<sup>329</sup>

This is exactly why we need a Just Transition: even though efforts are being made to phase out dirty fuels, people who have been marginalized are still being left behind. It is critical for our communities to ensure that when agreements are made with energy developers, procurement agreements are put in place to hire and train community-based Indigenous people.

## 6.3 POLICY SUCCESSES AND SOLUTIONS IN INDIGENOUS COMMUNITIES

Approaches to promoting renewable energy implementation include technical, financial, regulatory and policy solutions, as well as enhancing collaboration and partnership, information sharing, and skill development.<sup>330</sup> Within colonial governance structures, policy mechanisms that might offer support specifically geared toward Indigenous-owned renewable energy project uptake include: **price adders** for both generation and transmission; additional funding and financing bodies dedicated to Indigenous projects; and continuing education programs that offer incentives for on-reserve Indigenous communities to build their own project development capacity. Proven policy mechanisms for accelerating the uptake of renewables include: implementing national **feed-in tariff** programs; removing fossil fuel subsidies; adjusting the pricing of electricity to fully account for social and environmental impacts; funding for public education outreach; support for lower income households; and electricity **demand management** programs.<sup>332</sup>

Radical policy transformation is needed to remove existing barriers faced by Indigenous communities, as well as promote renewable energy and energy sovereignty. Governments can create policies and

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327. Government of Canada. (2019). Task Force: Just Transition for Canadian Coal Power Workers and Communities. <https://www.canada.ca/en/environment-climate-change/services/climate-change/task-force-just-transition.html>.


328. Mertins-Kirkwood, Hadrian, and Z. Deshpande. (2019). Who Is Included in a Just Transition? Considering Social Equity in Canada’s Shift to a Zero-Carbon Economy. Canadian Centre for Policy Alternatives. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition\\_final.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition_final.pdf).

329. Ibid

330. Fitzgerald, Eryn and Dave Lovekin. (2018). “Renewable Energy Partnerships and Project Economics: Research supporting Indigenous–utility partnerships and power purchase agreements”. Pembina Institute. <https://www.pembina.org/reports/re-partnerships-and-project-economics.pdf>.

331. Krupa, Joel. (2012). “Identifying Barriers to Aboriginal Renewable Energy Deployment in Canada.” Energy Policy 42: 710-14.

332. Sovacool, Benjamin K. (2009). “The Importance of Comprehensiveness in Renewable Electricity and Energy-Efficiency Policy.” Energy Policy 37, no. 4: 1529-41.



programs that provide Indigenous communities with better access to the money and resources they need, either by providing financing directly, or by creating incentives and fostering conditions that promote investment.<sup>333</sup>

Examples of such government initiatives may include any of the following:

- Supporting Independent Power Producers (IPPs), long-term Power Purchase Agreements (PPAs), and equitable power purchase rates.<sup>334</sup> Access to these agreements would increase lender confidence and improve financing options. PPAs increase the certainty of cash-flow and revenue for project developers and can help provide access to capital (often through debt financing).<sup>335</sup>
- Incentivizing renewable energy with feed-in tariffs, tax incentives, or price adders, while disincentivizing fossil fuels by basing prices on an accurate accounting of both subsidies and negative externalities.<sup>336</sup> A more accurate PPA rate structure can be set when the full costs and benefits of building and operating within a diesel-based energy system are accounted for - in comparison to renewables-based generation.<sup>337</sup>
- Providing direct funding for community capacity building, renewable energy projects, and the installation of more efficient technologies in diesel-reliant communities.<sup>338,339</sup> Direct government investments reduce financial risk, making it easier for Indigenous communities to raise additional debt capital funding (financial resources that will be repaid at an agreed interest rate) to cover total project costs.<sup>340</sup>
- Incentivizing projects which practice early and respectful engagement with Indigenous communities, encourage stronger partnerships, and provide adequate time for Indigenous communities to prepare and contribute input.<sup>341</sup>
- Adopting policies which encourage private partners to ensure that Indigenous partners hold a minimum 50% ownership on clean energy projects. This fosters empowerment and self-determination.<sup>342</sup>

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333. Qitoras, Marvin. (2021). "Better government policies will unlock the cash remote Indigenous communities need for clean energy". Pembina Institute. <https://www.pembina.org/blog/better-government-policies-will-unlock-cash-remote-indigenous-communities-need-clean-energy>.

334. Fitzgerald, Eryn and Dave Lovekin. (2018). Renewable Energy Partnerships and Project Economics: Research supporting Indigenous–utility partnerships and power purchase agreements. Pembina Institute. <https://www.pembina.org/reports/re-partnerships-and-project-economics.pdf>.

335. Qitoras, Marvin. (2021). "What's a fair and equitable price for renewable energy in remote communities?". Pembina Institute. <https://www.pembina.org/blog/whats-fair-and-equitable-price-renewable-energy-remote-communities>.

336. Qitoras, Marvin. (2021). "Better government policies will unlock the cash remote Indigenous communities need for clean energy". Pembina Institute. <https://www.pembina.org/blog/better-government-policies-will-unlock-cash-remote-indigenous-communities-need-clean-energy>.

337. Qitoras, Marvin. (2021). "What's a fair and equitable price for renewable energy in remote communities?". Pembina Institute. <https://www.pembina.org/blog/whats-fair-and-equitable-price-renewable-energy-remote-communities>.

338. Ibid.

339. Ibid.

340. Qitoras, Marvin. (2021). "Better government policies will unlock the cash remote Indigenous communities need for clean energy". Pembina Institute. <https://www.pembina.org/blog/better-government-policies-will-unlock-cash-remote-indigenous-communities-need-clean-energy>.

341. Ibid.

342. Ibid.

- Exploring “renewable portfolio standards,” which require utilities to generate a specific portion of their power via renewable-energy assets.<sup>343</sup>
- Diversifying energy developers and energy supply to facilitate a move away from crown utility-led electricity and toward community- and Indigenous-led electricity generation. This strategy will support the energy transition, energy justice, and economic reconciliation with Indigenous peoples.<sup>344</sup>

Colonial governments aside, Indigenous communities have been finding success using their own traditional knowledge and governance systems. Valine Brown speaks to the importance of honouring Haida relationships to the land and waters:

“As Haida citizens, we know and have our inherent rights and title to this place, and intimately and immediately connected to that is our responsibility to this place. We know who we are, we know where we are going to be born, where we are going to live and where we are going to die and that we have a responsibility to take care of our communities and each other, and this place. So for me, and a lot of what we’ve heard, especially from Haida citizens, is that: this is a responsibility that we have to ourselves and to each other, and to Haida Gwaii, and to honor that, and to honor our land and our waters. Obviously, being an island nation, becoming energy sovereign, taking that leadership, and taking that action, is a climate solution. We are proud environmental stewards here, Haida citizens and our neighbors. We know this is going to make us resilient in the face of climate change.”<sup>345</sup>

## WISDOM FROM COMMUNITIES

### HAIDA NATION SUPPORTIVE PARTNERSHIPS

Valine Brown speaks to the importance of positive relationships within her community’s renewable energy journey. “There were a small number of funders who just saw the people, the passion, and the work that we were doing,” she says. “They offered support, partnership, and funding for the initial vision that really uplifted us in the work that we were doing. [...] Funders who are going to give and trust in the community and the work that’s happening without restriction and without onerous requirements, that’s really contributed to our success, the partners who come to the table and trust the work that we are doing.”<sup>346</sup>

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<sup>343</sup>. Quitoras, Marvin. (2021). “What’s a fair and equitable price for renewable energy in remote communities?”. Pembina Institute. <https://www.pembina.org/blog/whats-fair-and-equitable-price-renewable-energy-remote-communities>.

<sup>344</sup>. Ibid.

<sup>345</sup>. Brown, Valine. Haida Nation. (2021). Personal communication regarding just transition policy, Haida Nation, and Swiilawiid Sustainability Society.

<sup>346</sup>. Ibid.



## **SIX NATIONS OF THE GRAND RIVER DEVELOPMENT CORPORATION (SNGRDC) GOOD GREEN ENERGY POLICIES SUPPORTS COMMUNITY PROJECTS**

Matt Jamieson of the Six Nations of the Grand River Development Corporation (SNGRDC) describes how feed-in tariff programs and price adders have benefited community projects:

“The feed-in tariff program that was launched at that time in Ontario, which we call ‘Feed-In Tariff Version 1.0’ - it came out and included an “Aboriginal Adder” [which] was an incentive that was linked to the level of equity participation of the Indigenous community. Of course that was attractive both for the Indigenous community but also for the developer. That was helpful because it changes the economics, it incentivizes the partnership.”

Matt applauds the **Canada Infrastructure Bank** on their recent announcement, which outlines a \$1 billion dollar pledge designed to provide infrastructure financing solutions to Indigenous communities. He also speaks of the successes of the **Aboriginal Loan Guarantee**, which provides financing for Indigenous communities:

“In Ontario, the Ontario Finance Authority launched a program called the ‘Aboriginal Loan Guarantee’ - as you may know, raising equity and financing for Indigenous communities is always a hurdle, so the ‘Aboriginal Loan Guarantee’ program was put in place to help finance by way of a guarantee, basically a credit enhancement from the government.”

Policy can also be used to encourage developers and industry partners to engage in respectful relationships with Indigenous communities. Matt notes that the Ontario Green Energy Act<sup>347</sup> included consultation with Indigenous communities, which “positioned communities in a way to get a heads up on what’s in the planning stages for energy projects, and so that gave a little bit of an advanced notice for those communities who wanted to participate and find the means to engage.”<sup>348</sup>

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347. Government of Ontario. (2018). Ontario Scraps the Green Energy Act. <https://news.ontario.ca/en/release/50684/ontario-scraps-the-green-energy-act>.

348. Jamieson, Matt. (2021). Six Nations of the Grand River. Personal communication regarding just transition policy and Six Nations of the Grand River Development Corporation.

## **TAKU RIVER TLINGIT THE NEED TO WORK TOGETHER**

Peter Kirby of the Taku River Group of Companies has the following words of advice for would-be renewable energy partners:

“Relationships, understanding, and working WITH First Nations is the path forward. Go in truly believing you will learn from the community. Don’t go in as a teacher even if you have more knowledge in a given area. Go in with a mind open to different ways of being, different ways of living, different measures of success, and build relationships. It is through relationships that understanding will come and then the path will become clear. So often governments claim to not have the time to build relationships but neither government nor First Nations have gone anywhere and the problems that plague First Nations continue to exist.”<sup>349</sup>

## **LOUIS BULL TRIBE CREATING PARTNERSHIPS WITH NON-INDIGENOUS ALLIES**

Our communities are already one step ahead in the Just Transition. Louis Bull Tribe in Maskwacis, Alberta, has a long-term vision for moving from dependency on coal-fired electricity to producing renewable power. The Tribe partnered with Iron and Earth to provide solar installation training to some of their members in order to install solar panels on their daycare. They also invited fellow oilsands workers from neighbouring communities to join - enabling them to expand their skill sets and broaden their job prospects.<sup>350</sup> Providing retraining opportunities in the renewable energy sector is vital to the shift away from fossil fuels to a decarbonized energy future.

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<sup>349</sup>. Kirby, Peter. (2021). Taku River Tlingit First Nation. Personal communication regarding just transition policy and Taku River Tlingit First Nation.

<sup>350</sup>. Yano, Sherry. (2018). Oil and gas workers go solar with Louis Bull Tribe. David Suzuki Foundation.  
<https://david Suzuki.org/story/oil-and-gas-workers-go-solar-with-louis-bull-tribe/>.





## 6.4

# VOICES FROM OUR COMMUNITIES OUR IDEAL FUTURE

After hearing the experiences of communities across Turtle Island, we developed a collective vision of what policy could and should look like moving forward. This ideal policy landscape integrates values like reconciliation, relationship building, and meaningful inclusion, as well as strategies that are more equitable and practical considering the realities faced by Indigenous communities. These recommendations are in alignment with the findings of other researchers<sup>351</sup> as well as our **Decolonizing Climate Policy in Canada** report.

We thank the Indigenous communities, climate leaders, and researchers who have contributed to the Just Transition so far. These recommendations are offered as a call to action for policymakers and industry partners to move towards a Just Transition with Indigenous communities:

### 1. Relationships - Building Partnerships and Enhancing Collaboration

- Meaningfully include Indigenous communities and Nations as full partners and co-creators at policy decision-making tables.
- Respect Indigenous sovereignty and leadership by way of federal commitments to Nation-to-Nation, Inuit-Crown, and government-to-government relationships.
- Respect Indigenous rights to self-determination and Free Prior and Informed Consent (FPIC) in the process of developing policy as well as in the contents of those policies and plans.
- Respect diverse Indigenous knowledges, governance systems, and belief systems.

### 2. Capacity Building - Supporting Sovereignty and Self-Sufficiency

- Support and create capacity-building initiatives that foster energy sovereignty and self-sufficiency - for example: community education programs, and training programs (e.g. technical skills development, business, leadership, project management, etc.).
- Facilitate the transfer of knowledge between communities - highlight and share Indigenous-led renewable energy projects that can be used as positive examples for others.
- Recognize different ways of building capacity and different forms of expertise. Capacity-building may include non-technology-based skills such as community building, education, and cultural revitalization.

### 3. Equity-Oriented Policy - Creating Fair and Just Energy Solutions

- Take into account the lived realities faced by Indigenous communities, both rural and urban, in different regions of the country, by incentivizing clean energy solutions that suit the community's location and needs - such as fuel switching and appropriate renewable energy

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351. Reed, Graeme, Brunet, Nicolas D., McGregor, Deborah, Scurr, Curtis, et al. (2022). "Toward Indigenous visions of nature-based solutions: an exploration into Canadian federal climate policy". *Climate Policy*, 22:4, 514-533, DOI: 10.1080/14693062.2022.2047585. <http://works.bepress.com/deborah-mcgregor/41/>



infrastructure. Develop equity-based energy prices that offer lower energy costs for those who need it, since total costs can be recovered by the rest of the customer body.

- Integrate policy mechanisms which reduce financial barriers to creating renewable energy projects, and which incentivize energy efficient appliances. Such mechanisms might include implementing stronger energy efficiency guidelines, feed-in tariffs, or price adders for renewable energy projects. Funding saved due to the presence of these mechanisms might be used to upgrade inefficient generators, install high-efficiency technologies, or promote fuel switching.
- Disincentivize the use of fossil fuels by eliminating subsidies and instituting accurate pricing which accounts for current subsidies and negative externalities alike.
- Actively address the systemic inequalities perpetuated by the settler colonial relationships, processes, and structures of so-called Canada.
- Meaningfully include Indigenous communities in the creation of policy and ensure energy transition policy will not cause disproportionate negative impacts to Indigenous Peoples or other marginalized groups.
- Respond to the Truth and Reconciliation Commission's calls to action, as well as those from the Royal Commission on Aboriginal Peoples and the National Inquiry into Missing and Murdered Indigenous Women and Girls.

#### **4. Procurement Approaches - Cultivating Democratized Energy Systems**

- Support Indigenous ownership and democratized energy systems by reevaluating utility-regulator profit models, promoting grid access for Independent Power Producers, and developing equitable Power Purchase Agreement (PPA) rates.
- Facilitate meaningful partnerships between Indigenous communities and utilities through consultation requirements, education, and training.
- Work toward purposeful clarification of energy policy jurisdiction, alongside better alignment of provincial, territorial, and federal mandates.

#### **5. Interrupt the Status Quo - Decolonizing and Decentralizing Energy Systems**

- Meaningfully create space for Indigenous governance and leadership, outside of the constraints of colonial and capitalist systems. This means explicitly acknowledging the legacy of colonialism and the associated systems of oppression still tied to our energy systems, as well as recognizing the sovereignty and self-sufficiency of Indigenous communities.
- Decolonize and decentralize energy systems by including Indigenous leadership in utilities regulation, infrastructure ownership, partnerships, policy development processes, or all of the above. Doing so advances self-determination, energy sovereignty, and reconciliation efforts.



## CONCLUSION - A STORY OF CHANGE

From what we have heard across Turtle Island, renewable energy projects offer both tangible and intangible benefits. Some Nations have witnessed their communities gaining energy sovereignty, which has in turn brought about employment, skill development, and lasting socio-economic improvements. Many communities are no longer dependent on fossil fuels and are instead generating their own sustainable and reliable sources of renewable energy. We have learned that the Just Transition pathway is also a pathway to community wellbeing - from energy provision, to cultural revitalization, to community health and pride.

However, we have also learned about the barriers to renewable energy implementation - including colonialism, racism, and other systems of oppression. To achieve a Just Transition, we need systemic change - both within our communities and within the provincial, territorial, and federal governments. Without a Just Transition, marginalized communities will disproportionately face the costs and risks of both energy transition policy<sup>352</sup> and the adverse impacts of climate change. To effectively address the climate crisis, a truly “Just” Transition must incorporate and uplift the voices, needs, and leadership of Indigenous communities in order to avoid reproducing existing inequalities. This is not only socially equitable - Indigenous wisdom also presents practical solutions to the climate crisis. We are of these lands and waters - we carry intergenerational knowledge and teachings that have sustained our people and planet since time immemorial.

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352. Mertins-Kirkwood, Hadrian, and Z. Deshpande. (2019). Who Is Included in a Just Transition? Considering Social Equity in Canada's Shift to a Zero-Carbon Economy. Canadian Centre for Policy Alternatives. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition\\_final.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition_final.pdf).

353. Brown, Valine. (2019). “This is what Indigenous energy sovereignty looks like - A just transition case study.” Briarpatch Magazine. <https://briarpatchmagazine.com/articles/view/indigenous-climate-action>.



Canadian colonial policies aimed at physical destruction, territorial absorption, and assimilation have systematically stripped Indigenous Peoples of our right to choose our own future. The current energy transition is an important opportunity for Indigenous communities. Initiating renewable energy projects is a worthwhile path to successfully reclaiming and regaining permanent and meaningful access to our lands and restoring our socio-cultural fabric. Energy sovereignty enables our communities to own and operate energy systems that align with our Indigenous cultures, knowledge, and land rights - all while reducing the negative impacts of colonialism and capitalist resource extraction.<sup>353</sup>

All of this being said, we are by no means dangling renewable energy as the ultimate solution to the entrenched inequalities endured by Indigenous communities from coast to coast. Nor are we suggesting that every community has the necessary resources to initiate its own renewable energy project. Yet, from coast to coast, we have witnessed communities with a wide range of human and non-human resources initiate change for the better, working with the water, wind, sun, and plants gifted to us by the Creator. These are gifts that can support our efforts toward true energy sovereignty - on our own terms: the water that keeps flowing, the blowing wind, the ever-shining sun, and the plants that thrive, wither, and grow back year after year.

We feel confident that as Indigenous communities across Turtle Island assert their identities and occupy political and economic spaces, new horizons will open up for our children and grandchildren. They will be able to stand tall upon their undeniable rights to health and wellbeing, safety and security, self-sufficiency and self-determination. This is the future we want for ourselves and our next generations. This is our time, and our opportunity to steer our life's work in the direction of a Just Transition.





## 7.1

## OUR OFFERINGS TO YOU

We would like to offer our support to Indigenous communities across Turtle Island who are following the path of a Just Transition. In addition to this Guide, we would like to offer the following:

- A **glossary and resource list** (Section 8, below) outlines key information about the Just Transition, renewable energy technologies, programs, funding, and more.

- If you are interested in capacity-building programming, we highly recommend the following:

**Indigenous Clean Energy 20/20 Catalyst Program:** an Indigenous clean energy capacity-building program which provides “practical and applied learning about renewable energy projects, community energy planning, energy efficiency and conservation, and advanced energy systems.”

**Indigenous Clean Energy Project Accelerator Program:** designed to support the start-up and development of Indigenous energy efficiency housing projects. The program is open to all First Nation, Inuit, and Métis communities and housing organizations who are committed to making improvements to housing. Over 18 months, participating communities will move through capacity-building training, gain access to a national network of experts and mentors, and complete the program with a concrete energy efficiency project underway.

**Indigenous Clean Energy Network:** increases Indigenous involvement and leadership in clean energy by providing a space to learn about clean energy technologies, provides opportunities to connect with others who are moving projects forward, and shares funding, programming, and job opportunities.

**Indigenous Clean Energy - Decolonizing Power Podcast** (also available on **Spotify**)

### Power to the People

**ImaGENation, an Indigenous Youth Project Development Program:** 12 teams of Indigenous youth (ages 18-30) from across Canada are selected and enrolled into an 18-month program that provides a culturally embedded ecosystem of support to plan and implement their clean energy project idea. Each team will receive project-specific mentorship, coaching, cultural guidance, and a \$30,000 project award to support their project goals.

**Indigenous Clean Energy Generation Power Program:** An Indigenous youth clean energy training and career development program.

**Indigenous Clean Energy Regional Energy Advisor Training Program:** This program will make it easier for Indigenous communities and housing providers to access energy audits and find ways to reduce utility bills through energy efficiency actions.

- Sacred Earth Solar and ICA have developed a **Renewable Energy Funding Database** which lists potential funding sources for renewable energy projects in so-called Canada. To keep in the know on Sacred Earth Solar's projects, advocacy, and climate and energy education, check out Sacred Earth Solar's website and social media pages: **@sacredearthsolar** on Instagram, **@sacredearthSOL** on twitter, and **Sacred Earth Solar** on facebook. If you would want more information on our Just Transition programs, email **jt@sacredearth.solar**

- If you would like to learn more about what a Just Transition looks like, or about Melina Laboucan-Massimo's experiences, please visit **www.sacredearth.solar**, and watch:

**SFU Public Square | Hope in Resistance: Stories of Climate Justice**

**University of Victoria | Indigenous Perspectives and Approaches to Climate Action**

**Reimagining Our Relationships | A Conversation with David Suzuki and Melina Laboucan-Massimo**

- To stay up to date on workshops, training, and networking opportunities organized through Indigenous Climate Action's Just Transition programming, check out ICA's **website** and social media pages: **@indigenousclimateaction** on Instagram, **@indigenous\_ca** on Twitter, and **Indigenous Climate Action** on Facebook.

# GLOSSARY AND RESOURCES

## 8.1

## GLOSSARY

### B

#### BIOMASS ENERGY

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Plants, trees, and crops are made up of biomass - organic material in which the sun's energy is stored through photosynthesis.<sup>354</sup> Biomass energy is the conversion of biomass into “useful energy,” such as heat, electricity, and liquid fuels. Biomass is only considered renewable if the consumption rate does not exceed the regeneration rate (e.g. forest growth).<sup>355</sup> In this Guide, we focus primarily on small-scale biomass systems and projects that use wood waste.

### C

#### CARBON SINK

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Carbon sinks, such as forests, absorb more carbon than they release.<sup>356</sup>

#### CLEAN ENERGY

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In this Guide, clean energy projects are considered non-fossil fuel based energy sources. We have also included examples of “alternative” or “transition” energy sources, such as nuclear, biomass, and mixed-used energy - these sources can be viewed as a bridge between fossil fuel energy and our renewable energy future.

#### CLIMATE JUSTICE

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Climate justice focuses on the root causes of the climate crisis through an intersectional lens of racism, classism, misogyny, and environmental harm. Climate justice organizers serve communities on the frontlines of climate change, working to ensure the right of all people to live, learn, work, play and pray in safe, healthy and clean environments by creating holistic solutions and strategies that tackle root causes.<sup>357</sup> In many instances climate injustices are also referred to as environmental injustices and the terms are used interchangeably (see environmental justice below).

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354. Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. *Renewable & Sustainable Energy Reviews*, 39,748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

355. Natural Resources Canada. (2017). “About Renewable Energy.” Government of Canada. <https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy/7295>.

356. National Geographic. (N.d.). Carbon Sources and Sinks. <https://education.nationalgeographic.org/resource/carbon-sources-and-sinks/>

357. Hoodwinked in the Hothouse. (2021). “Resist False Solutions to Climate Change”. Third Edition. California

# D

## DEMAND- AND SUPPLY-SIDE MANAGEMENT

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Energy management is used to alter levels of energy demand and supply. While demand-side management encourages consumers to modify their level and pattern of electricity usage, such as by encouraging energy conservation and efficiency,<sup>358</sup> supply-side management alters energy use levels by focusing on how energy is produced and delivered to consumers (e.g. via infrastructure and technology).<sup>359</sup>

## DISTRIBUTED ENERGY STORAGE

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Distributed energy storage is a decentralized energy storage system which replaces the conventional practice of obtaining electricity from a centralized grid. Energy is typically stored in batteries to ensure a readily available, stable source of electricity - this can be particularly useful for more variable forms of energy generation (such as wind and solar).<sup>360</sup>

## DISTRICT ENERGY

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District systems heat space and water very efficiently through a centralized, renewably-powered heating system. Heat is distributed to buildings through a network of insulated, buried pipes.<sup>361</sup>

# E

## ECO-HOUSING

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An environmentally low-impact home that is both built and operated to be sustainable, minimize greenhouse gas emissions, and reduce energy needs.<sup>362</sup> For example, homes may be built with environmentally-friendly materials, equipped with solar panels, or use energy and water conserving technologies.

## ELECTRIC GRID

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An electric grid is a system of energy generation, transmission, and distribution made up of three major parts:<sup>363,364</sup>

- **DEVICES THAT GENERATE ELECTRICITY**

These devices convert energy to electricity via a generator (e.g. converting the mechanical energy from a wind turbine into electrical energy). Energy generation

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358. Science Direct. (N.d). Energy Demand Management. <https://www.sciencedirect.com/topics/engineering/energy-demand-management>.

359. Ibid

360. Project Drawdown. (2020). Distributed Energy Storage. <https://www.drawdown.org/solutions/distributed-energy-storage>.

361. Project Drawdown. (2020). District Heating. <https://www.drawdown.org/solutions/district-heating>.

362. Park, Chris. (2007). "Ecohouse". A Dictionary of Environment and Conservation: Oxford University Press.

363. Canadian Electricity Association. (2021). North American Power Grid.

364. Afework, Bethel, et al. (2020). "Energy Education - Electrical Grid."

requires fuels (such as coal, oil, or gas), or primary energy flows (like solar, wind, or hydropower).<sup>365</sup>

- **DEVICES THAT CONDUCT, FILTER AND SAFELY REGULATE THE FLOW OF ELECTRICITY**  
These devices are used for transmitting electricity to customers.<sup>366</sup> A transformer is used to increase voltage with a proportional decrease in electric current - this allows electricity to flow long distances through power lines.<sup>367</sup> Although energy is lost when electricity travels long distances, high voltage power lines can reduce these losses.<sup>368</sup> Before electricity reaches consumers, the voltage has to be taken back down to safer levels via substations and smaller transformers.<sup>369</sup>
- **DEVICES THAT CONSUME ELECTRICITY**  
These devices represent consumer use or “load.” The patterns of our everyday lives lead to varying demands for electricity by hour, day, and season.<sup>370</sup> e.g. phones, laptops, tvs etc.

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## ENERGY CONSERVATION AND EFFICIENCY

Energy conservation efforts include saving energy by eliminating wasteful use, reducing total use, and increasing energy efficiency.<sup>371</sup> Energy efficiency entails the use of efficient technologies to reduce the amount of energy required to provide products and services. These technologies can be used in housing, buildings, communities, industry, and transportation - they lead to benefits such as lower energy costs, reduced emissions, improved operating performance, and increased asset values.<sup>372</sup>

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## ENERGY SOVEREIGNTY

Energy sovereignty enables our communities to own and operate our own energy systems, thereby increasing our resiliency and allowing for a democratic energy system. When Indigenous communities utilize renewable and locally available energy sources, our dependency on fossil fuel corporations is reduced. Having energy sovereignty means having access to an energy system that aligns with our Indigenous cultures, knowledge, and land rights while mitigating the negative impacts of colonialism and capitalist resource extraction.<sup>373</sup>

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365. Ibid.

366. Ibid.

367. Ibid.

368. Ibid.

369. Ibid.

370. Union of Concerned Scientists. (2015). How the Electricity Grid Works. <https://www.ucsusa.org/resources/how-electricity-grid-works>.

371. Park, Chris, and Michael Allaby. (2017). “Energy Conservation”. In A Dictionary of Environment and Conservation: Oxford University Press.

372. Natural Resources Canada. (2020). Energy Efficiency. Government of Canada. <https://www.nrcan.gc.ca/energy-efficiency/10832>.

373. Brown, Valine. (2019). “This is what Indigenous energy sovereignty looks like - A just transition case study.” [Online]. Briarpatch Magazine. <https://briarpatchmagazine.com/articles/view/indigenous-climate-action>.



## ENVIRONMENTAL JUSTICE

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Environmental justice embraces the stance that all people and communities have a right to equal protection from environmental crises, and that the voices and self-determination of the communities first and most harmed need to be centered in finding solutions to such crises. The global EJ movement recognizes that Black, Brown, Indigenous, migrant and poor communities around the world have historically been most harmed by (and are least likely to benefit from) the global extractive economy. The first multinational EJ summit in 1991 produced 17 Principles of Environmental Justice that have guided EJ and climate justice movement platforms and practices ever since.<sup>374</sup>

## EXTRACTIVISM

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Extractivism is a contemporary manifestation of settler colonialism demonstrated by acts of dispossession (such as resource extraction and state control over land), which threatens the land-based self-determination of our Indigenous communities.<sup>375,376</sup> Extractivism is both a principle and a practice, rooted in the commodification of land and the notion that nature is limitless and valued primarily for its monetary worth.<sup>377</sup>

## F

### FEED-IN TARIFF

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A feed-in tariff is an economic policy used to promote investment in and production of renewable energy by guaranteeing producers certain minimum prices. These prices are set so that a reasonable profit can be made - putting long-term contracts and guaranteed prices in place protects energy producers from financial risk and incentivizes renewable energy investments.<sup>378,379</sup>

## G

### GEOHERMAL ENERGY (GEOEXCHANGE, HEAT PUMPS)

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Geothermal energy is provided by the thermal energy from the interior of the earth, which is stored in both rock and trapped steam or water.<sup>380</sup> Geexchange systems, ground-source heat pumps, and geothermal heat pumps (also known as low-temperature or shallow geothermal systems) utilize the consistent temperature below the earth's surface as the exchange medium for heating and cooling buildings.<sup>381</sup>

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**374.** Hoodwinked in the Hothouse Collective. (2021). "Resist False Solutions to Climate Change". Third Edition. California

**375.** Irlbacher-Fox, Stephanie. (2014). "Traditional Knowledge, Co-Existence and Co-Resistance." *Decolonization: Indigenety, Education & Society* 3, no. 3 (3): 145–58.

**376.** Willow, Anna. (2016). "Indigenous ExtrACTIVISM in Boreal Canada: Colonial Legacies, Contemporary Struggles and Sovereign Futures." *Humanities* 5 (3): 55. <https://doi.org/10.3390/h5030055>.

**377.** Ibid.

**378.** Roby, Helen. (2013). *Feed-In Tariff. A Supplementary Dictionary of Renewable Energy and Sustainability*: Oxford University Press.

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**380.** Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). *Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology*. *Renewable & Sustainable Energy Reviews*, 39:748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

**381.** Ibid.

# H

## HEAVY WATER

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Heavy water is water that contains “heavy” hydrogen - also known as deuterium - in place of regular hydrogen and is typically used in nuclear reactors as a coolant and moderator.<sup>382</sup>

# I

## INDEPENDENT POWER PRODUCER (IPP)

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An Independent Power Producer is a non-utility entity that owns an electricity generation system and sells electricity to utility companies and end-users. Examples include for-profit companies, First Nations economic development organizations, municipalities, non-profit organizations or cooperatives, or a combination of these (joint ventures).<sup>383</sup>

## INDIGENOUS FOOD SOVEREIGNTY

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Indigenous food sovereignty is defined, practiced and embodied differently across the diverse food systems of Indigenous Nations.<sup>384</sup> Broadly, the Indigenous food sovereignty movement emphasizes the revitalization of our Indigenous foods and ecological knowledge systems, allowing our communities to have ultimate control and influence over their food system as a primary contributor to health and form of cultural resurgence.<sup>385</sup>

## INDIGENOUS RIGHTS AND SOVEREIGNTY

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Refers to the inherent, collective rights held by Indigenous Peoples, including the “right to independence through self-determination regarding governance, land, resources and culture.”<sup>386</sup> Indigenous rights are affirmed through various Treaty agreements (Nation to Nation legal agreements), as well as in the Canadian constitution, and internationally in the UN Declaration on the Rights of Indigenous Peoples.

# J

## JUST TRANSITION

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The term “Just Transition” originated with labour unions, environmental justice advocates, and low-income communities of colour.<sup>387</sup> Although there is no universal definition, the term generally refers to a social justice framework that considers,

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382. University of Calgary. (n.d). Energy Education. [https://energyeducation.ca/encyclopedia/Heavy\\_water](https://energyeducation.ca/encyclopedia/Heavy_water).

383. Qitoras, Marvin. (2021). “What’s a fair and equitable price for renewable energy in remote communities?”. Pembina Institute. <https://www.pembina.org/blog/whats-fair-and-equitable-price-renewable-energy-remote-communities>.

384. Daigle, Michelle. (2019) “Tracing the Terrain of Indigenous Food Sovereignities.” The Journal of Peasant Studies 46(2): 297-315. <https://doi.org/doi:10.1080/03066150.2017.1324423>.

385. Côté, Charlotte. (2016). “Indigenizing” Food Sovereignty. Revitalizing Indigenous Food Practices and Ecological Knowledges in Canada and the United States.” Humanities 5 (3): 57. <https://www.mdpi.com/2076-0787/5/3/57>.

386. Henderson, William B., and Catherine Bell. (2019). “Rights of Indigenous Peoples in Canada.” The Canadian Encyclopedia. Historical Canada. <https://www.thecanadianencyclopedia.ca/en/article/aboriginal-rights>.

387. Climate Justice Alliance. (n.d). Just Transition: A Framework for Change. <https://climatejusticealliance.org/just-transition/>.

prioritizes, and ensures equitable outcomes for workers and communities by implementing policies to reduce greenhouse gas emissions.<sup>388</sup> In this case, equity means a fair distribution of costs and benefits, which also takes into consideration communities who have historically been marginalized (such as women, Indigenous Peoples, immigrants, and other racialized groups).<sup>389</sup>

The definition of a Just Transition has also been expanded to represent a range of strategies and principles which help to “transition whole communities to build thriving economies that provide dignified, productive and ecologically sustainable livelihoods; democratic governance and ecological resilience.”<sup>390</sup>

## L **LIFE-CYCLE EMISSIONS**

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A life-cycle perspective on emissions accounts for all of the emissions connected to goods or services, regardless of which industrial or economic activities or sectors produce these emissions (e.g., energy, mining, manufacturing, and waste sectors).<sup>391</sup>

## **LOAD**

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A “load” refers to the power consumption of the device(s) being used in an energy system.

## M **MACROGRID AND MICROGRID**

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The macrogrid (also known simply as “the grid”) is a massive, complex electrical network that delivers energy by connecting producers, utility companies, and consumers. The centralized nature of “the grid” hinders the transition from dirty energy produced in just a few places to a more decentralized system where clean energy can be produced locally.<sup>392</sup>

A microgrid is a small-scale, independent power grid of distributed electricity generation technologies (solar, wind, hydropower, etc.) paired with energy storage, backup generation, and load management tools. Microgrids allow for localized and mixed-use energy sources, which increase resilience and reduce the amount of energy lost in transmission and distribution.<sup>393</sup>

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**388.** Mertins-Kirkwood, Hadrian, and Z. Deshpande. (2019). Who Is Included in a Just Transition? Considering Social Equity in Canada’s Shift to a Zero-Carbon Economy. Canadian Centre for Policy Alternatives. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition\\_final.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition_final.pdf).

**389.** Ibid.

**390.** Climate Justice Alliance. (n.d). Just Transition: A Framework for Change. <https://climatejusticealliance.org/just-transition/>.

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**392.** Project Drawdown. (2020). Microgrids. <https://www.drawdown.org/solutions/microgrids>.

**393.** Ibid.

## MIXED-ENERGY SOURCE

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Combines different sources of energy.<sup>394</sup>

# N

## NEOCOLONIALISM

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The term “neocolonialism” was originally coined by Ghana’s first president, Kwame Nkrumah, and signals the continued domination of settler colonial societies through the ongoing predominance of their market preferences, political influences, and/or cultural and educational dominance.<sup>395</sup>

## NUCLEAR ENERGY

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Nuclear power is electricity produced through nuclear reactions. Energy is released during a nuclear reaction as a result of the conversion of mass into energy. Nuclear energy is released in two ways: by fission (splitting a heavy atomic nucleus in two) and by fusion (combining light atomic nuclei).<sup>396</sup> Whether nuclear energy can be truly considered renewable is subject to ongoing debate. The use of uranium (a non-renewable fuel that is used most widely by nuclear plants for nuclear fission<sup>397</sup>), along with the land exploitation, nuclear waste, and greenhouse gas emissions inherent to nuclear energy production, present challenges to the sustainability of the industry. This Guide addresses the complexities of using nuclear energy as a transition fuel.

# P

## POWER PURCHASE AGREEMENT (PPA)

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A Power Purchase Agreement is a long-term contractual agreement between energy sellers and buyers, which are typically electric utilities. The agreement determines that a pre-established amount of energy will be purchased from an electricity generation facility over a long period of time (usually 20 to 30 years), with a set escalation (or de-escalation) rate.<sup>398</sup>

## PRICE ADDER

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Price adder means with respect to a designated System that is a Community Renewable Energy Generation Project, a pricing component added to the contract price if the seller has achieved the applicable small subscriber participation level under the applicable program.

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394. Ibid.

395. Murrey, Amber. (2020). “Colonialism.” *International Encyclopedia of Human Geography*. 2: 315-26. <https://www.sciencedirect.com/science/article/pii/B9780081022955108042>.

396. Oxford Reference. (2004). Nuclear Energy. In *Oxford World Encyclopedia: Philip’s*. <https://www.oxfordreference.com/view/10.1093/acref/9780199546091.001.0001/acref-9780199546091-e-8266>.

397. U.S. Energy Information Administration. (2022). Nuclear Explained. <https://www.eia.gov/energyexplained/nuclear/>.

398. Quitoras, Marvin. (2021). “What’s a fair and equitable price for renewable energy in remote communities?”. Pembina Institute. <https://www.pembina.org/blog/whats-fair-and-equitable-price-renewable-energy-remote-communities>.

## PROACTIVE POLICY

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“Proactive” efforts maximize the potential benefits of shifting to a clean economy by acting in anticipation of future challenges and our changing energy needs. These efforts aim to avoid a crisis before it happens. Proactive transition policies include investments in education and capacity building, apprenticeship training, and local hiring requirements.<sup>399</sup>

## R

## REACTIVE POLICY

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“Reactive” energy transition efforts minimize the costs to affected workers and communities moving away from fossil fuels. These efforts are a response to events that have already occurred. For example, fossil fuel workers might be given income support, provided with skills training, or transitioned into new jobs or retirement.<sup>400</sup>

## RENEWABLE ENERGY

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Sources of renewable energy are continually replenished by the Earth’s natural systems and are not finite or exhaustible like fossil fuels.<sup>401</sup> Renewable energy is derived directly from the sun (thermal and photovoltaic energy), indirectly from the sun (wind, hydropower, and biomass), or from other movements and mechanisms of the Earth (geothermal energy).<sup>402</sup>

## S

## SETTLER COLONIALISM

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A hierarchical and racialized system of power that perpetuates the oppression of Indigenous Peoples, while reinforcing colonial beliefs, values, and modes of governance.<sup>403,404</sup> The sovereignty and political economy of settler colonial states is built on the dispossession of Indigenous Nations and the exploitation of our lands.<sup>405</sup> For example, early assimilation policies in Canada intended to eliminate Indigenous

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**399.** Mertins-Kirkwood, Hadrian, and Z. Deshpande. (2019). Who Is Included in a Just Transition? Considering Social Equity in Canada’s Shift to a Zero-Carbon Economy. Canadian Centre for Policy Alternatives. [https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition\\_final.pdf](https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2019/08/Who%20is%20included%20in%20a%20just%20transition_final.pdf).

**400.** Ibid.

**401.** Natural Resources Canada. (2017). About Renewable Energy. Government of Canada.

<https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy/7295>.

**402.** Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. *Renewable & Sustainable Energy Reviews*, 39:748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

**403.** Coulthard, Glen Sean, and Gerald R. Alfred. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. Indigenous Americas. Minneapolis, Minnesota: University of Minnesota Press.

**404.** Burow, Paul Berne, Samara Brock, and Michael R. Dove. (2018). Unsettling the Land: Indigeneity, Ontology, and Hybridity in Settler Colonialism. *Environment and Society* 9 (1): 57. <https://doi.org/10.3167/ares.2018.090105>.

**405.** Barker, Adam J. (2015). “A Direct Act of Resurgence, a Direct Act of Sovereignty”: Reflections on Idle No More, Indigenous Activism, and Canadian Settler Colonialism. *Globalizations: Occupying Subjectivity: Being and Becoming Radical in the Twenty-First Century* 12 (1): 43-65. <https://doi.org/10.1080/14747731.2014.971531>.

Peoples' distinct legal, social, cultural, religious, and racial identities through forced displacement from our lands, cultures, and communities.<sup>406,407</sup> Settler colonialism is often considered a “failed invasion,” as Indigenous resistance and resurgence continues to this day.<sup>408</sup>

## SOLAR ENERGY

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Solar energy generation is the conversion of the sun's energy to electricity via solar photovoltaic (PV) systems or to hot water via solar thermal systems. PV systems contain a PV cell, a semiconductor device which, by converting the energy of the sun, generates direct-current (DC) electricity. PV systems are classified into two major categories - “off-grid” and “grid-connected.” Solar heating and cooling technologies use the sun's thermal energy (heat) to supply hot water, space heating, and cooling for residential, commercial, and industrial applications.<sup>409</sup>

# W

## WATER ENERGY (HYDROPOWER, RUN-OF-THE-RIVER)

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Energy derived from water, or hydropower, is created when turbines convert moving water into electricity. The flow of water in rivers allows us to create hydropower - meaning we rely both on the hydrological cycle and the force of gravity to move water from high to low elevations. Dams are common producers of hydropower, however large dams can have very damaging environmental and social impacts. Run-of-the-river projects are less damaging and draw energy for electricity from the available flow of a river - power generation relies on precipitation and run-off, which may vary by day, month, or season.<sup>410</sup>

## WIND ENERGY

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Wind power is the conversion of the wind's kinetic energy to a “useful” form of energy, such as mechanical and electrical energy - this is often accomplished with wind turbines.<sup>411</sup>

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**406.** Truth and Reconciliation Commission of Canada. (2015). Final report of the Truth and Reconciliation Commission of Canada: Summary: Honouring the Truth, Reconciling for the Future. Winnipeg: Truth and Reconciliation Commission of Canada.

**407.** Kuma, Mohan B. , and Michael Tjepkema. (2019). Suicide among First Nations people, Métis and Inuit (2011-2016): Findings from the 2011 Canadian Census Health and Environment Cohort (CanCHEC). National Household Survey: Aboriginal Peoples. Statistics Canada.

**408.** Murrey, Amber. (2020). “Colonialism”. International Encyclopedia of Human Geography. (2). Edited by Audrey Kobayashi: Elsevier.

**409.** Ellabban, Omar., Abu-Hub, H. & Blaabjerg, F. (2014). Renewable Energy Resources: Current Status, Future Prospects and Their Enabling Technology. Renewable & Sustainable Energy Reviews, 39:748-64. <https://doi.org/10.1016/j.rser.2014.07.113>.

**410.** Ibid.

**411.** Ibid.

## 8.2

## FURTHER RESOURCES

# 1

### **POWER TO THE PEOPLE (PRODUCED BY REALWORLD MEDIA)**

The following links will take you to previews of the Power to the People episodes referenced in this Guide. Full episodes can be watched in English and Cree on the **Aboriginal Peoples Television Network (APTN)**. Power to the People is also available on The Weather Network TV channel as well as on the **The Weather Network website**.

**Episode 1: Little Buffalo, AB (Lubicon Lake Band)**

**Episode 2: Kanaka Bar, BC (Kanaka Bar Indian Band)**

**Episode 3: Alert Bay, BC (Namgis First Nation, Tlowit'sis First Nation, and Mamalilikala First Nation)**

**Episode 4: Haida Gwaii, BC (Haida Communities of Old Masset and Skidegate)**

**Episode 5: Listuguj, QC (Mi'gmaq Communities of Listuguj First Nation, Gespeg First Nation, and Gesgapegiag First Nation)**

**Episode 6: Sechelt, BC (shíshálh Nation and Squamish First Nation)**

**Episode 7: Teslin, YK (Teslin Tlingit Nation)**

**Episode 8: Six Nations of the Grand River, ON (Six Nations of the Grand River Development Corporation)**

**Episode 9: Bella Coola, BC (Nuxalk Nation and Snuneymuxw First Nation)**

**Episode 10: Tla-o-qui-aht, BC (Tla-o-qui-aht Nation)**

**Episode 11: Taku River Tlingit, BC (Taku River Tlingit Nation and Tseil Waututh Nation)**

**Episode 12: Kluane, YK (Kluane First Nation)**

**Episode 13: Gull Bay, ON (Gull Bay First Nation)**

# 2

## **CLEAN ENERGY PROGRAMS, TRAINING, AND NETWORKING**

Indigenous Clean Energy 20/20 Catalyst Program

Indigenous Clean Energy Network

Swiilawiid Sustainability Society

First Nations Power Authority

# 3

## **ENERGY, ELECTRICITY, AND THE ELECTRIC GRID**

What is Energy?

Renewable Energy 101

Swiilawild Energy Toolkit

Project Drawdown

Out of Sight, Out of Mind: Gender, Indigenous rights, and energy development in northeast British Columbia, Canada - Amnesty International

# 4

## **ENERGY POLICY**

Power Shift in Remote Indigenous Communities: A cross-Canada scan of diesel reduction and clean energy policies - Pembina Institute

Targeted Universalism - Othering and Belonging Institute

# 5

## **FOOD SOVEREIGNTY**

Earth to Tables Legacy

# 6

## **FUNDING AND PARTNERSHIPS**

Sacred Earth Solar and ICA's Renewable Energy Funding Database

Indigenous Economic Development Corporations - The ABCs

Government of Canada - Clean Growth Hub



# 7

## **JUST TRANSITION**

Just Transition - A Framework for Change - Climate Justice Alliance

Indigenous Just Transition - Indigenous Environmental Network

# 8

## **RENEWABLE ENERGY**

### **SOLAR**

Renewable Energy 101: How Does Solar Energy Work?

### **HYDROPOWER**

Renewable Energy 101: How Does Hydroelectricity Work?

### **BIOMASS**

Renewable Energy 101: How Does Biomass Energy Work?

### **GEOHERMAL**

Renewable Energy 101: How Does Geothermal Energy Work?

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