

Kootenay Cleantech Consultation **Final Report**



Table of Contents

<u>Overview</u>	3
<u>Acknowledgements</u>	4
<u>Preliminary Research</u>	6
<u>Consultation Events</u>	7
<u>Project Outcomes/Impact</u>	9
<u>Diversity</u>	9
<u>Lessons Learned</u>	11
<u>Nelson Consultation</u>	11
<u>Areas of Interest</u>	11
<u>Challenges</u>	11
<u>Opportunities</u>	13
<u>Cranbrook Consultation</u>	15
<u>Areas of Interest</u>	15
<u>Challenges</u>	16
<u>Opportunities</u>	16
<u>Next Steps</u>	21

Overview

The transition towards a cleaner, greener, and more sustainable future is imperative if we're to avoid the worst effects of climate change, and regional initiatives aimed at developing and scaling effective solutions tailored to the unique circumstances of local communities will continue to play a crucial role in driving this transformation.

In pursuit of understanding the challenges and opportunities for cleantech development and adoption in the Kootenays, Foresight and the Kootenay Association for Science and Technology, with support from the Economic Trust of Southern Interior British Columbia and the Columbia Valley Community Economic Development Office, held two in-person consultation events in Nelson and Cranbrook.

These consultations provided a platform to engage stakeholders, including industry representatives, government officials, community leaders, Indigenous partners, economic development practitioners, and cleantech experts, in insightful discussions and knowledge sharing.

During these events, we explored potential avenues for collaboration on cleantech projects and discussed the unique challenges faced by Kootenay-based communities and industries to reduce their carbon footprint.

This report intends to capture the key lessons learned during these consultations and to provide a snapshot of existing cleantech projects, priorities, and challenges to be overcome to advance regional cleantech opportunities in the Kootenays.



Acknowledgements

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We would also like to thank the project teams at Foresight Canada and the Kootenay Association for Science and Technology (KAST) for preparing and facilitating the consultation events, the many local businesses, communities and First Nations (ʔaq'am and ʔakisq'nuk) for attending, and Robyn Peel from Community Futures for connecting us with participants to make this project a success.

Contact



Joshua Young

**Sr. Manager, BC Transportation
Ecosystem | Foresight Canada**

Joshua is a sustainability professional with a background in project management, research, and program design. He enjoys working collaboratively to understand complex problems and test innovative solutions.

Before Foresight, Joshua built and led the Business Climate Resilience program at the Nelson & District Chamber of Commerce and holds a Master of Science in Human Ecology from Lund University in Sweden.

jyoung@foresightcac.com | [LinkedIn](#)



Melanie Fontaine

**Executive Director,
Kootenay Association for Science & Technology**

Melanie Fontaine brings to KAST passion, skill and deep commitment to benefit the Kootenay science and tech communities. After moving to the West Kootenays in 2020, she managed a small business while settling into the Kootenay life. Melanie comes from a strong scientific background in biochemistry with a Master of Science degree from the University of Alberta.

Some of her experiences include working at a non-profit hospital in Kenya and for the Provincial Health Services Authority in Vancouver. She enjoys creating relationships across the region and bringing renewed energy to programs, both current and future, for KAST.

info@kast.com | [LinkedIn](#)

Preliminary Research

How We Define Cleantech

- Any good or service designed with the primary purpose of contributing to remediating or preventing any type of environmental damage
- Any good or service that is less polluting or more resource efficient than equivalent normal products that furnish a similar utility

Finding Cleantech Innovators in the Kootenays

To identify Kootenay-based cleantech companies and sustainability initiatives, we conducted desk research and tapped into the networks of regional economic development organizations such as the Kootenay Association for Science and Technology, Selkirk Innovates, Metal Tech Alley, Community Futures, Chambers of Commerce, and municipal Economic Development Officers.

A number of the cleantech companies identified during the preliminary research were not previously known to Foresight, which has led to a better understanding of the diverse types of cleantech innovations in the region.

Identified cleantech innovators were contacted via email or phone and invited to join the in-person consultations.

Regional Sustainability and Cleantech Priorities

Prior to hosting the consultation events, Foresight conducted five stakeholder meetings over Zoom with municipalities, academic institutions and economic development organizations to discuss the unique sustainability and cleantech priorities of communities in the Kootenays.

Through these dialogues, we were able to identify the following areas of interest:



**Renewable Energy
and Hydrogen**



**Agritech /
Sustainable
Agriculture**



**Sustainable
Transportation**



**Wood Fibre
Utilization**



**Battery Recycling
and Supply Chain**



**Sustainable
Mining Practices**

Consultation Events

Two in-person consultation events were held in Nelson and Cranbrook on May 30 and 31, respectively. The consultations were structured in the following way:

We began the consultation with a quick round of introductions to get familiar with who was in attendance. Each participant was asked to introduce themselves, the organization they represent and why they chose to attend the consultation.

Once we we're all acquainted with one another, the Foresight and KAST teams delivered a quick presentation outlining the purpose of the consultation and what to expect throughout the day before jumping into a group discussion.

Open Discussion

This open discussion was all about knowledge-sharing to get the Foresight team up to speed on the environmental- and climate-related challenges, priorities action areas, and existing or planned projects in the Kootenays. To help kick things off, we provided the participants with the following prompts:

- What are your climate/sustainability priorities?
- What sustainability/cleantech projects do you have planned or ongoing?
- What challenges are you facing when:
 - Taking action to reduce your emissions or addressing your sustainability/climate issues?
 - Developing, adopting, or sourcing clean technologies?
 - Exporting your clean technologies?
- What support do you need?

Breakout Session

After a quick break, participants were divided into groups and asked to create one or more climate/sustainability projects to benefit their communities. These project ideas could be planned projects, existing projects, or desired projects.

Once time was up, the groups presented their projects and were asked to share any interesting perspectives or ideas that were brought up during their group discussions.

Voting

While the groups were presenting their projects and ideas, the Foresight and KAST teams were identifying and making note of the various themes and project areas on large format sticky notes.

These stickies were then fixed to a whiteboard. Participants were given three votes each and asked to vote for the thematic areas, project areas, and/or specific projects that they found most interesting or needed.

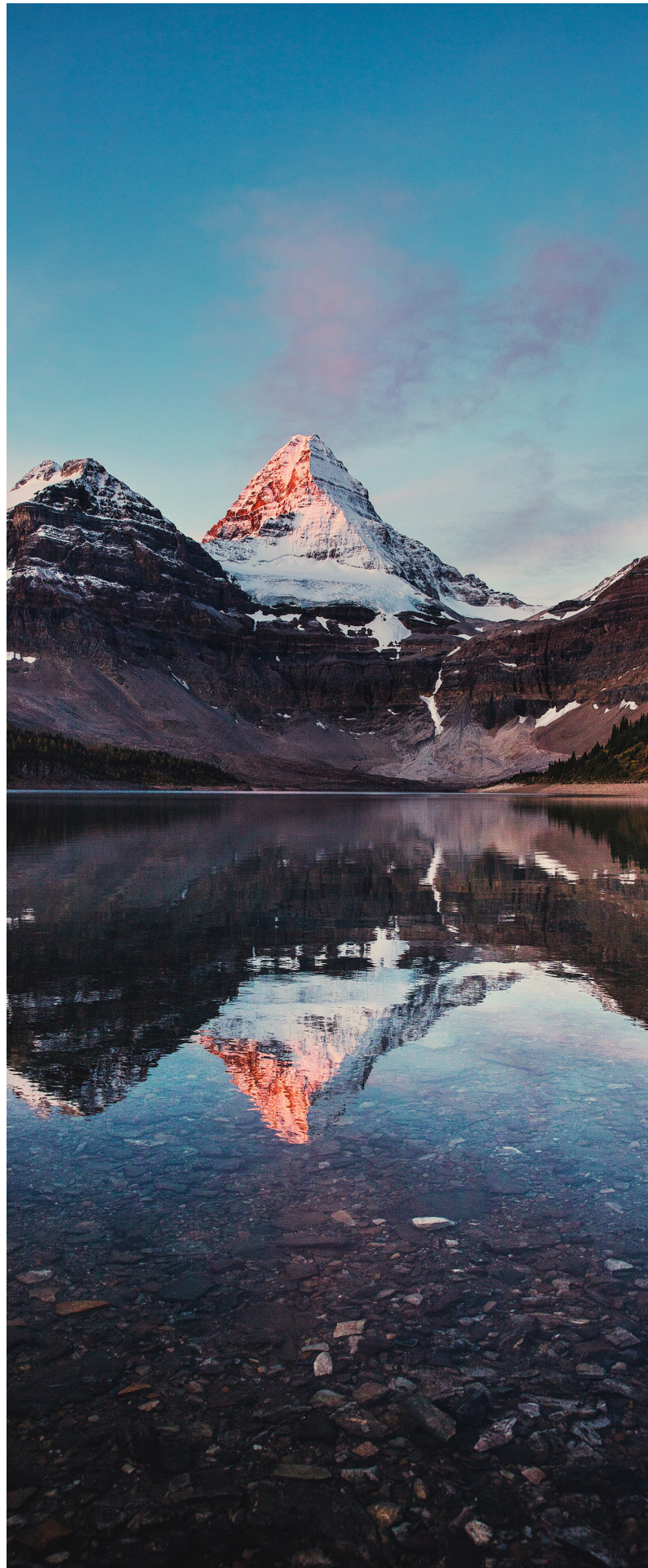
Breakout Session

With the votes tallied, new breakout groups were created based on the winning thematic and project areas, and participants were encouraged to “choose their own adventure” by joining the group they found most interesting.

In this breakout session, participants were asked to add more structure to the proposed projects and were prompted to consider the following questions when developing their ideas:

- What problem does this project solve?
- Who is impacted by this project?
Who benefits from this project, and who is negatively impacted?
- What challenges will have to be overcome for this project to be successful?
- Who have you identified as necessary project partners for this project to be successful?
- How much will this project cost? How will this project be funded?
- How long will this project take to complete?
- Do the necessary resources, infrastructure, and skills exist today in the Kootenays to make this project successful?

Once time was up, the groups were asked to discuss their project in detail and to use the prompts provided to highlight the challenges, opportunities, and support needed. Participants were encouraged to indicate their willingness to partner to continue to work on this project post-consultation.



Project Outcomes/Impact

The project successfully convened regional ecosystem partners to discuss sustainability and climate priorities in the Kootenays. Several planned or ongoing projects were discussed during the consultation, and project proponents were able to raise awareness about their projects, receive valuable feedback about their approach, existing resources and funding opportunities, and be connected with potential collaborators.

Additionally, Foresight has established a presence in the Kootenays and is beginning to forge strong long-term relationships with stakeholders and rightsholders in the region. Many potential projects have been identified as a result of the in-person consultation events, and we're currently in talks with stakeholders to explore how Foresight, through the BC Net Zero Innovation Network, can support projects that lead to cleantech adoption and economic development opportunities for Kootenay-based communities.

The specific project outcomes are detailed in the Lessons Learned section below.

Diversity

This project encouraged a strong sustainable economy that works for everyone by ensuring it was inclusive of diverse groups in our communities in several ways:

1

Through mandatory Indigenous Awareness Training for all Foresight Staff

2

Through the hiring of consultants to devise an Indigenous outreach strategy

- The consultants advised Foresight Staff on how to build respectful, meaningful, and long-term relationships with Indigenous peoples, specifically the Métis, Ktunaxa, Sylix and Sinixt.

3

The consultation events were attended by representatives from ʔaq'am and ʔAkisq'nuk First Nations.

4

Through fostering a safe and inclusive space during the consultation events where diverse voices were heard and understood



5

The consultation event in Cranbrook was also held in a historic venue, owned by, operated by and located on the Ktunaxa nation, providing an opportunity for all attendees to learn about indigenous culture and history as well as improved accessibility for members of the nation itself. Hosting the event here also supported the Ktunaxa nation financially and encouraged connectivity between the tech, industry and indigenous communities.

Lessons Learned

Nelson Consultation

Areas of Interest



Sustainable
Transportation



Liquid Waste
Recovery



Carbon Capture
Utilization and
Storage (CCUS)



Methane
Capture



Biochar



Battery Supply Chain
/ Recycling



Renewable
Energy



Knowledge
Sharing

Challenges

Capacity

The topic of capacity building was discussed at length during the Nelson Consultation and was arguably the biggest takeaway from the session.

Participants noted that most small-to-medium-

sized businesses, municipalities, and regional governments often lack the time, expertise, resources, and/or capacity to write grant applications, seek out funding, conduct research, or even run programs.

Research regarding available clean technologies, required infrastructure, the direction of industry and innovation, and available funding sources require significant time and capacity. Participants reported that, in many cases, this work is completed “off the side of their desks.”

Cleantech innovators also doubted that local regulators possessed the necessary knowledge, expertise, and capacity to make timely decisions about increasingly more complicated projects, thereby jeopardizing potential economic development opportunities.

Finally, the group discussed the need to shift toward a more regional project approach, where communities and organizations leverage collaborations to benefit the entire region. A model where municipalities across the Kootenays pool resources to cut costs and build capacity when launching pilot and demonstration projects was discussed, as well as a mechanism to share project learnings with smaller communities that do not have access to the same resources as their larger neighbours. Participants argued that this approach has the potential to accelerate the adoption of clean technologies by avoiding wasted time completing duplicative pilot projects and through knowledge sharing.

Recommended Next Step:

Create a mechanism to support the co-development and co-funding of projects that have the potential to benefit the Kootenay region.

Climate Denialism, Anti-Establishment Sentiment, and Polarization in Society

When discussing barriers to climate action and cleantech adoption in the region, participants identified several socio-political factors that must be overcome. Specifically, participants from the public and non-profit sectors discussed how progress has been slow partly due to the challenge of changing people’s attitudes towards climate change. Polarization in society was identified as a significant barrier to action, as some outspoken members of society deny the existence of climate change or believe that climate action is the pretext through which the government is attempting to limit their freedoms, while others are frustrated with the lack of progress toward climate goals and want to see more aggressive action. This leaves decision-makers in a tough situation where they must attempt to accommodate both ends of the spectrum.

Low Attendance in Nelson and the Need for a Similar Consultation in Revelstoke Area

Attendance was low at the Nelson event, and many of the businesses we contacted did not respond to us. Also, a number of the organizations that indicated interest did not end up attending the consultation; this could be in part due to the lack of capacity, as is discussed above, or due to a lack of understanding or awareness of what/who Foresight is. Whatever the reason, we feel that the findings from this consultation would have been strengthened with more representation from the business community.

Additionally, a similar consultation would benefit businesses and economic development entities in the Revelstoke area. Attracting participants from the areas around Revelstoke, like Nakusp, Golden, Radium Hot Springs and even New Denver, was challenging due to the long commutes. There is an opportunity to build on this work and meet with communities in that region to discuss their unique challenges and climate priorities to understand how best to serve them.

Cleantech Opportunities

Project Ideas To Benefit Our Communities

Regional Multi-Modal Sustainable Transportation System

Transportation accounts for

70% of all emissions

in the Regional District of Central Kootenay.

The group discussed developing a strategy for a sustainable, resilient, and better-connected transportation system across the Kootenays that integrates various low-carbon transportation methods to move people and goods efficiently in the region.

Potential Partners:

Ministry of Transportation, BC Transit, regional districts, municipalities, Kootenay RideShare, Kootenay CarShare Cooperative, First Nations, FortisBC, Nelson Hydro, and BC Hydro.

Challenges:

- **Herding Cats:** Transportation is a complicated space with various stakeholders involved, making it difficult to align priorities and actions.
- **Capacity Limitations:** Capacity and sufficient resources are required for significant projects.
- **Funding:** An interconnected, sustainable regional transportation system will require significant funding for infrastructure, low-carbon vehicle technologies, and consultations with communities and experts.

Fibre Utilization Projects (Slash/Burn):

The potential for economically viable fibre utilization projects in the Kootenay Region was discussed. The group explored the potential for the development and adoption of a technology that would allow for fermentation on-site before transportation out of the forest.

Fibre could then be transformed into an input for district heating, bioproducts, bioenergy, or biochar. Research commissioned by the RDCK outlines the challenges and opportunities for [bioenergy in the region](#); however, bioenergy is not the sole option for residual forestry waste.

Perceived Impacts:

- Forest fire fuel mitigation and a reduced need for slash-pile burning keeping our communities smoke-free
- Potential to turn a waste stream into bioproducts or energy, leading to emission reductions and economic development opportunities
- Potential to develop and pilot new technologies to economically process fibre in the forest

Potential Challenges:

- **Transportation:** Transporting residual forest waste out of the forest is costly.
- **Secure Supply of Feedstocks:** Uncertainty regarding the long-term supply of easy-to-access economic fibre. As you go deeper into the forest, the costs become higher.

Kootenay Battery Hub

The Battery Metals Association of Canada has identified the need for two battery recycling hubs in Canada, one in the East and the other in the West. Trail is home to the largest Lead Battery Recycler in the Pacific Northwest (KC Recycling) and Retrieval Technologies, specializing in EV battery recycling. Teck Resources also has a smelter in Trail. This presents the region with a unique opportunity to become the home of the Western Battery Hub.

Potential Partners:

The Battery Metals Association of Canada, Teck Resources, KC Recycling, Retrieval Technologies, Ministry of Energy, Mines and Low Carbon Innovation, Pacifican, Regional Districts, and Municipalities.

Potential Challenges:

- **Investment Attraction / Funding:** A project of this size and magnitude necessitates significant capital attraction and investment on behalf of all levels of government to be successful.
- **Regulatory Innovation:** Project participants have identified the need for regulations to be updated for this project to be successful. The experience so far has been that regulators at the local/regional level are not equipped to deal with a project of this size.

Revisiting Nelson's Liquid Waste Management Strategy

The group discussed an interest in exploring opportunities to adopt commercialized clean technologies that transform Nelson's liquid waste into an input for bioenergy or another application.

Decarbonizing Nelson's Corporate Fleet

The group discussed the possibility of piloting/ demonstrating zero emission vehicles in Nelson's corporate fleet.

Regional Mechanism to co-develop cleantech pilot projects with neighbouring communities

Not all of the municipalities in the Kootenays have equal access to capacity, expertise, and funds to run cleantech pilot projects, and a pilot project completed in one community does not necessarily need to be duplicated in another. Instead, communities could devise a mechanism to pool their resources to co-develop cleantech pilot projects and share lessons learned.



Lessons Learned

Cranbrook Consultation

Areas of Interest



**Agritech /
Sustainable
Agriculture
Practices**



**Biochar
Applications
in Mining**



**Wood Fibre
Utilization**



**Renewable
Energy and
Electrification**



**Indigenous Energy
Independence and
Multi-Generational
Economic
Development**



Hydrogen



**Circular Economy
in the Outdoor
Recreation Space**



**Sustainable
Transportation**



Capital Attraction



**Net Zero Homes
and Building**

Challenges

Participants at the Cranbrook Consultation identified more developed cleantech projects that were either in the planning phase or already underway, and as a result, the challenges highlighted by this group differed from those identified in Nelson.

Uncertainty Regarding Direction of Innovation and/or Industry

Participants highlighted the uncertainty regarding the direction of innovation as a barrier to cleantech adoption. Municipalities want to spend public funds wisely when investing in new technologies. Participants stated that technical knowledge gaps, a lack of awareness regarding the range of cleantech solutions available, uncertainty about how clean technologies integrate into existing systems, and whether their investments in cleantech solutions today will stand the test of time, were challenges highlighted during the consultation.

Skilled Trades, Workforce, and Workforce Housing

During the consultations and preliminary research, participants expressed concern about the difficulty in attracting the skilled workforce necessary for cleantech development and adoption in the region, due to the high costs associated with homeownership, higher rents, and a lack of suitable housing stock. Participants noted that students and skilled trades find it difficult to find affordable housing in the larger municipalities and are having more luck in adjacent communities. However, the high costs of vehicle ownership and the lack of reliable public transportation options create an unsustainable situation where those taking public transportation arrive late and have to leave early, and those with their own vehicles are finding it increasingly difficult to get to work affordably.

Capital Attraction and Local Investment

Capital attraction has also been a challenge for cleantech companies in the region. Participants felt that the Kootenay region was often overlooked and that the bulk of attention was paid to innovators in the lower mainland.

Additionally, local cleantech companies strongly desired to ensure their projects remain majority-owned by local organizations and community members to benefit economic development in the Kootenays. However, securing the necessary funding locally remains a challenge.

Transportation

As was alluded to above, participants highlighted the importance of reliable transportation of goods and people to accelerate cleantech and economic development in the region. This remains a challenge in the Kootenays, with most communities a distance from the TransCanada highways, and with challenging driving conditions across mountain passes.

Opportunities

Project Ideas To Benefit Our Communities

Fibre Utilization Projects (Slash Burning)

Potential for economically viable fibre utilization projects in the Columbia Valley and Kootenay Region. The group explored the potential for regional collection points where forestry companies could drop off residual fibre to be transformed into an input for district heating, bioproducts, bioenergy, or biochar.

Perceived Impacts:

Forest fire fuel mitigation and a reduced need for slash pile burning to keep our communities free of smoke

Potential to turn a waste stream into bioproducts or energy, leading to emission reductions and economic development opportunities

Potential to develop and pilot new technologies to process economic fibre in the forest

Potential Challenges:

- **Transportation:** Transporting residual forest waste out of the forest is costly.
- **Secure Supply of Feedstocks:** Uncertainty regarding the long-term supply of easy-to-access economic fibre. As you go deeper into the forest, the costs become higher.

Canadian Rockies International Airport – Aerospace & Renewable Energy Project

The city of Cranbrook and ʔaq'am (Aqam) First Nation are proposing to collaborate on the development of the endowment lands adjacent to the Canadian Rockies International Airport (CRIA) to construct a utility-grade renewable energy facility and develop regional employment opportunities.

Perceived Impacts:

- Development of commercial land near an international airport, providing an opportunity to attract new businesses to the area and allow existing businesses to distribute their goods more easily
- Employment and economic development opportunities for residents of the Columbia Valley and ʔaq'am (Aqam) First Nation

- Production of clean electricity to power decarbonization activities at the airport, its tenants, and potentially excess energy for producing low-carbon fuels
- Potential to create an aerospace innovation hub for developing low-carbon technologies with the availability of commercial hangar space, clean electricity and close proximity to Vancouver and Calgary

Potential Challenges:

- **Investment Attraction/Funding:** Remains a challenge for a project of this size and magnitude

Community Sea Can Farm Project (Agri-tech)

Involves creating greenhouses in sea cans for local production of nutritious food to be consumed by the community. The food would not have to be transported from faraway places to the community, thereby reducing transportation-related emissions and driving down the cost of food. The group also explored the possibility of energy capture from the greenhouse and generating energy or creating soil enhancements from agricultural waste.

Perceived Impacts:

- The availability of healthy, locally-produced food would positively impact the community.
- Organizations, like Save On Foods that want to source locally grown produce, would also be positively impacted.
- **Workforce Training / Knowledge Sharing:** Greenhouses can be a place for people to share knowledge about food security, food independence, hydroponics, agri-tech, and farming.

Potential Challenges:

- **Scalability:** We have relatively small communities in the Kootenays. Creating an economically viable model for decentralized urban farms could be a challenge.
- **Funding:** Will need to identify funding sources to operationalize the project. Topics explored were creating a co-op, utilizing tax revenues, and private capital.
- **Energy Balance:** Mitigation of unintended environmental consequences. For example, what are the ecological impacts of creating biofuels from agricultural waste vs. composting for soil health?
- **Breaking Down Silos:** Ensuring that the community is looking at what others are doing in the space to increase knowledge-sharing opportunities and to work across communities to identify ways to scale the project and make it commercially viable in the region.

Knowledge Sharing Platform

Many iterations of knowledge sharing platforms were discussed. From a World Class Knowledge Hub focused on sustainability and cleantech in the forestry, outdoor recreation, and mining sectors to a platform for municipalities across BC and Alberta to learn about each other's sustainability, climate and cleantech challenges and solutions.

Perceived Impacts:

- Ability to source solutions to similar challenges from other municipalities across the Pacific Northwest to avoid reinventing the wheel
- Potential to attract researchers, industry, startups, skilled labour, and investment into the Kootenays





Potential Challenges:

- **Data:** Companies are hesitant to share data, and questions arise about who owns the data, or knowledge produced and where that lives.
- **Saturation:** Several peer-to-peer networks exist already; do we need another one? How do you differentiate this platform from the others? How do you break down the barriers and make the platform interactive instead of just a knowledge dump?

Projects Already In The Works

Lighthouse Net Zero Business Park

A net zero business park that generates its own renewable energy through solar panels and potentially vertical access wind turbines. The hope is to one day generate enough excess electricity for the onsite production of green hydrogen to be used by Thor Hydrogen's hydrogen refuelling project. Additionally, Lighthouse Development Co-op partners are in conversations with ʔaq'am (Aqam) and ʔakisqʔnuk (Akisqnuq) First Nations to partner on this project, which will provide community economic development and workforce training opportunities to the local First Nations and community.

Potential Challenges:

- **Unknown Regulatory Risks:** although the proposed technologies are not new, the combination of these technologies, working together on one site, has yet to be done in British Columbia. It will require close coordination between project proponents and regulatory agencies.
- **Water Sources/Sanitation/Services:** The proposed site of the Lighthouse Net Zero Business Park needs to be hooked up to services such as potable water, wastewater, and roads. Hooking up the site to existing infrastructure is capital-intensive.

- **Investment Attraction:** The hope is for the Lighthouse Net Zero Business Park to be owned by, and benefit, those in the local community. Investment attraction remains a challenge as the project is estimated to be in the ballpark of \$30–50 Million.
- **Skilled Labour:** In many communities across the Kootenays, there is a need for more local, skilled labour to carry out the construction of the Lighthouse Net Zero Business Park. Workforce attraction is also difficult due to the need for more affordable housing options.

To learn more about this project, contact Kootenay Solar.

KORE Kootenay ReHub

The ReHub would include a series of local collection points where outdoor recreationists can drop off their damaged or unwanted items, such as GoreTex Jackets, Bike Frames, Bike Tires, etc., to be washed, repaired, repurposed, or recycled. The concept involves a travelling repair bus, a repurposing facility for gear bound for the landfill, and a shredding facility for those products that cannot be fixed so that waste can be transformed into new products.

Potential Challenges:

- **Communicating the Social and Economic Benefits of the Kootenay ReHub:** Developing a clear communication strategy on the circular economy will help this project become successful.
- **Academic Research Partnerships:** An essential ingredient to an effective communication strategy about an initiative's benefits is having data to back up your claims. Identifying opportunities to research the environmental benefits of the initiative, as well as how to create new products from materials collected, can help solve communication challenges and provide an exciting opportunity for the Kootenays to become a rec-tech research hub, bolstered by its existing reputation as a renowned outdoor tourism destination.
- **Long-term Capital Attraction:** Like most projects, capital attraction was identified as a challenge for this project. Identifying potential industry partners and developing a relationship with them can help get the proper exposure to other industry partners and investors.



Next Steps

With a focus on **next** steps rather than **last** steps, the BC Net Zero Innovation Network team encourages partners to reach out to discuss how we can leverage our funding to advance the projects discussed or other projects aimed at emission reductions and economic development through cleantech in the region. When projects are refined, we will convene the group again to prioritize projects, establish and facilitate working groups, support fundraising efforts, and initiate and manage projects.

