QUEST

ENABLING LOW CARBON ENERGY PROJECTS FOR INVESTMENT

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QUEST Canada is a national non-profit that supports communities in Canada on their pathway to net-zero. Since 2007, we've been facilitating connections, empowering community champions and influencing decision-makers to implement efficient and integrated energy systems that best meet community needs and maximize local opportunities. We develop tools and resources, convene stakeholders and rights holders and advise decision-makers — all with the goal of encouraging and enabling communities to contribute to Canada's net-zero goals.

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SPECIAL THANKS AND CREDIT

To the dozens of individuals and organizations participating in the engagement exercises. Particularly Indigenous individuals who generously shared their time and perspectives. Your contributions have been invaluable in shaping our understanding and informing our recommendations. We recognize that criticism may be associated with this research, and we want to assure you that we will do our best to address any concerns and take responsibility for any negative impacts. At the same time, we want to offer all the credit for the success of this study to you, the Indigenous participants, and to celebrate your crucial role in advancing Indigenous voices and knowledge in this work.

EXECUTIVE SUMMARY

Communities in Canada are increasingly developing low-carbon, local energy projects, but they face road-blocks when it comes to financing these projects. Canadian investors are increasingly seeking low-carbon investments, but are challenged to find these locally and at a scale large enough for investing.

The ***Enabling Low Carbon Energy Projects for Investment (ELCEPI)*** project aims to add resolution to the challenges stated above, and link discovered barriers and enablers to larger social movements as a means to synergize and advance both clean energy deployment and other social movements in parallel to one another.

INDIGENOUS RECONCILIATION IS FOUNDATIONAL TO CLEAN ENERGY OUTCOMES

The research highlighted the direct link between Canada's transition to clean energy and broader reconciliation efforts between Indigenous and settler communities as they are both based on outcomes of preservation, ecologically and culturally. In the absence of reconciliation, initiating a low-carbon energy transition on the same colonial and unfair basis as the current energy system will simply exacerbate existing disparities.

The clean energy transition is a once-in-a-lifetime opportunity that should be led by individuals and communities who have been living low-carbon lives and preserving ecosystems for millennia. The principles of Justice, Equity, Diversity, and Inclusion (JEDI), including Indigenous empowerment, must be integrated into the transition planning and implementation process.

Today, funding streams and capitalization strategies for non-Indigenous and Indigenous communities differ significantly. However, the planning requirements for both are very similar.

BARRIERS EXIST ALONG EACH PHASE OF A LOW CARBON PROJECT LIFE CYCLE

In addition to the requirement to embed Indigenous reconciliation, including consideration of Land Back, as well as JEDI principles in every decision to develop low-carbon, local energy projects, a number of other unique and common barriers were identified at each phase of a low carbon project cycle.

START-UP PHASE: FOUNDATION BUILDING

Foundation building involves establishing the necessary capacity, systems, and funding to conceptualize or scale community low-carbon energy projects.

Today, many funding streams don't cover the funding and capacity required for project conception, which puts champions at significant risk during the early stages of project inception. In addition, the complex legal and legislative landscape poses a significant capacity constraint, and many are unsure of where to begin or whom to approach for assistance. If funding is available and received, the bureaucratic procedures to secure and report on funding exacerbate these challenges.

START-UP PHASE: LOCAL CONTEXT ASSESSMENT

A Local Context Assessment is the process of analyzing the local environments and community circumstances that surround a particular situation and involves examining the immediate context, such as the legislative environment (e.g. energy production and distribution sovereignty restrictions), local deficits, and existing local resources that can inform and support the situation at hand.

This can be a challenging and resource-intensive

process, particularly for communities with limited access to project development capacity. Equally, the logistics and best practices required to create the needed well-informed governance structures are not always well understood, and many communities lack the necessary resources to execute them effectively. Further, project capacity and momentum often get stalled by changes in risk tolerance or political agendas.

START-UP PHASE: PLANNING

Planning is a critical process that involves several key components, including partnership development and contract management with the intent of creating investment-ready projects. These components are essential to ensuring that a project is planned effectively and executed successfully, as they help to establish clear communication channels and perform due diligence through studies and engagement to ensure that all parties are aligned towards achieving the project's goals.

Accessing relevant networks to find dependable and aligned partners can be challenging. To reduce project risk, technology validation, outcome projections, project viability, and securing an offtaker are critical. However, obtaining competent and cost-effective partners to execute due diligence is both time-consuming and expensive.

DEVELOPMENT PHASE

The Development Phase begins once the project is deemed "investment ready" and concludes upon a successful project rollout.

Insufficient local capacity in communities poses a hindrance to the successful execution of planned projects. This capacity includes but is not limited to trades, project managers, financing specialists, energy specialists, building specialists, social service experts, and engineers. Lack of local capacity can result in delays, financial repercussions, and other challenges. However, a significant risk is the creditworthiness of the community entity carrying out the project. Without sufficient credit, the project may come to a halt, preventing potential partners from engaging with the project.

OPERATIONS PHASE

The Operations Phase of low-carbon energy projects involves the operations and maintenance of renewable energy projects, as well as post-installation monitoring for retrofit projects. This phase also generates returns to pay back project costs. Revenue models for renewable energy projects can include power purchase agreements, feed-in tariffs models and net metering, while retrofit projects can use energy savings contracts such as energy leases, energy savings, and energy-as-a-service payback mechanisms.

The absence of adequate funding programs and insufficient compensation for the electricity generated by most clean energy projects render most projects unfeasible in many jurisdictions. Even when funding programs are implemented, the merchant return structures are perceived as uncertain, adversely affecting the project's financial viability.

One key challenge for community energy projects is that profits generated often go to investors and institutions who are not necessarily invested in addressing social equity gaps or reinvesting back into the community.

Longevity of owners and operators of community energy projects are additional critical factors. If community energy projects are to deliver long-term benefits, there must be a commitment to their ongoing operation and maintenance. Private sector partners may prioritize short-term profits over long-term community benefits, leading to a lack of investment in maintaining and operating the project.

THE SOLUTION LIES IN ENABLING VEHICLES THAT CAN DERISK PROJECTS FROM THE OUTSET

The research found that while there is sufficient funding available to support clean energy initiatives; the challenge is getting projects investment-ready. There needs to be a catalyst that mobilizes all of the existing organizations, ideas, and resources, and takes advantage of the available funding. Enabling Vehicles, sometimes referred as "hubs" were identified as a solution.

Local Enabling Vehicles (LEV) and Central Enabling Vehicles (CEV) are needed to resolve barriers by providing more specialized and efficient support to communities. LEVs have a well-connected interface with jurisdictional stakeholders while CEVs coordinate efforts across multiple LEVs, provide support, and focus on universal resolutions. By separating the two, we can avoid adding unnecessary layers of bureaucracy and ensure more efficient and specialized support for the community.

The LEV acts as regional chapters of the CEV that serves as a one-stop-shop to facilitate the community's participation in the low-carbon economy by providing local expertise, removing barriers, and helping establish community investment-ready products while fostering community champions. This vehicle is a jurisdictional subject expert that acts as the link between the community, CEV, and networks to fill gaps that communities face. They may assist in aggregating funding opportunities and projects, engaging subject experts to expedite project delivery, developing partnerships for communities, assessing resources, and driving change in deficient sectors while promoting JEDI practices throughout all sectors. LEVs also engage local contractors and suppliers, influence policy barriers to simplify and achieve better outcomes, and act as a dot connector and resource with the expertise to identify community gaps and fill them most appropriately.

CEVs are crucial in connecting LEVs learnings and driving the execution of broader strategic plans. CEVs play a key role in supporting LEVs through knowledge-sharing, unlocking resources, and providing best practices, while also advocating for policy changes and building relationships with external stakeholders. The ultimate goal of CEVs is to achieve effective outcomes for the community by offering technical assistance, capacity building, training and support, monitoring progress, and enforcing a JEDI-focused project development approach.

Building off this study and to address low-carbon capitalization barriers faced by communities, central and local enabling vehicles that engage with and offer leadership roles to Indigenous communities should be incubated. Providing financial and technical support for the planning, development, deployment and expansion of new and existing enabling vehicles is essential to mobilize low-carbon energy projects.

INTRODUCTION

BACKGROUND

Canadian communities are increasingly developing low-carbon, local energy projects, but they need help with financing these projects. Canadian investors are increasingly seeking low-carbon investments but are challenged to find local opportunities at a scale large enough for investment.

The ***Enabling Low Carbon Energy Projects for Investment (ELCEPI)*** project aims to add resolution to the capitalization challenges relating to community low-carbon energy projects and link discovered barriers and enablers to more significant social movements as a means to synergize and advance both low-carbon energy deployment and other social activities in parallel to one another.

METHODOLOGY

1. Agile Methodology for complex projects was used since the project looked at the issue from the perspectives of many stakeholders. As such, the project goals pivoted and evolved throughout the project as QUEST Canada dug further into the details.

2. Qualitative Methodology was also used to:
   a. Validate barriers amongst all stakeholders.
   b. Identify where considerations should be placed when suggesting solutions.

OBJECTIVES

Given the dynamic nature of our research and the imperative of staying abreast of emerging insights, our research objectives underwent multiple iterations. Through this process, we discovered that many communities face significant barriers in the early stages of project conception and need to be aware of aggregation. As a result, we expanded our scope to investigate barriers throughout a project's life cycle, starting from the Start-up Phase. Our early findings indicated that lower-income communities, particularly those with a history of marginalization and diversity, face unique challenges in project development. Moreover, we identified a disconnect between Indigenous and non-Indigenous projects. Based on our interviews and research, we settled on four final objectives, which appear disparate but are rooted in the overarching goal of overcoming barriers to the low-carbon energy transition.

INITIAL OBJECTIVE

To resolve community barriers to aggregate low-carbon energy initiatives to unlock capital from investors.

FINAL OBJECTIVES

- Identify barriers preventing communities from capitalizing low-carbon energy projects.
- Make recommendations to policymakers on creating policy, and financing architects to create supportive investment structures.
- Acknowledge Indigenous communities' resilience in the face of systemic oppression and ongoing harm caused by colonization. Recognize the importance of listening to Indigenous voices and supporting their leadership in decision-making processes related to energy development.
- Incorporate and showcase the principles of reconciliation and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)[1] into energy development practices to support the process of Land Back and recognize Indigenous peoples' inherent right to self-determination. Prioritize the revitalization of traditional knowledge and Indigenous-led approaches to energy development.

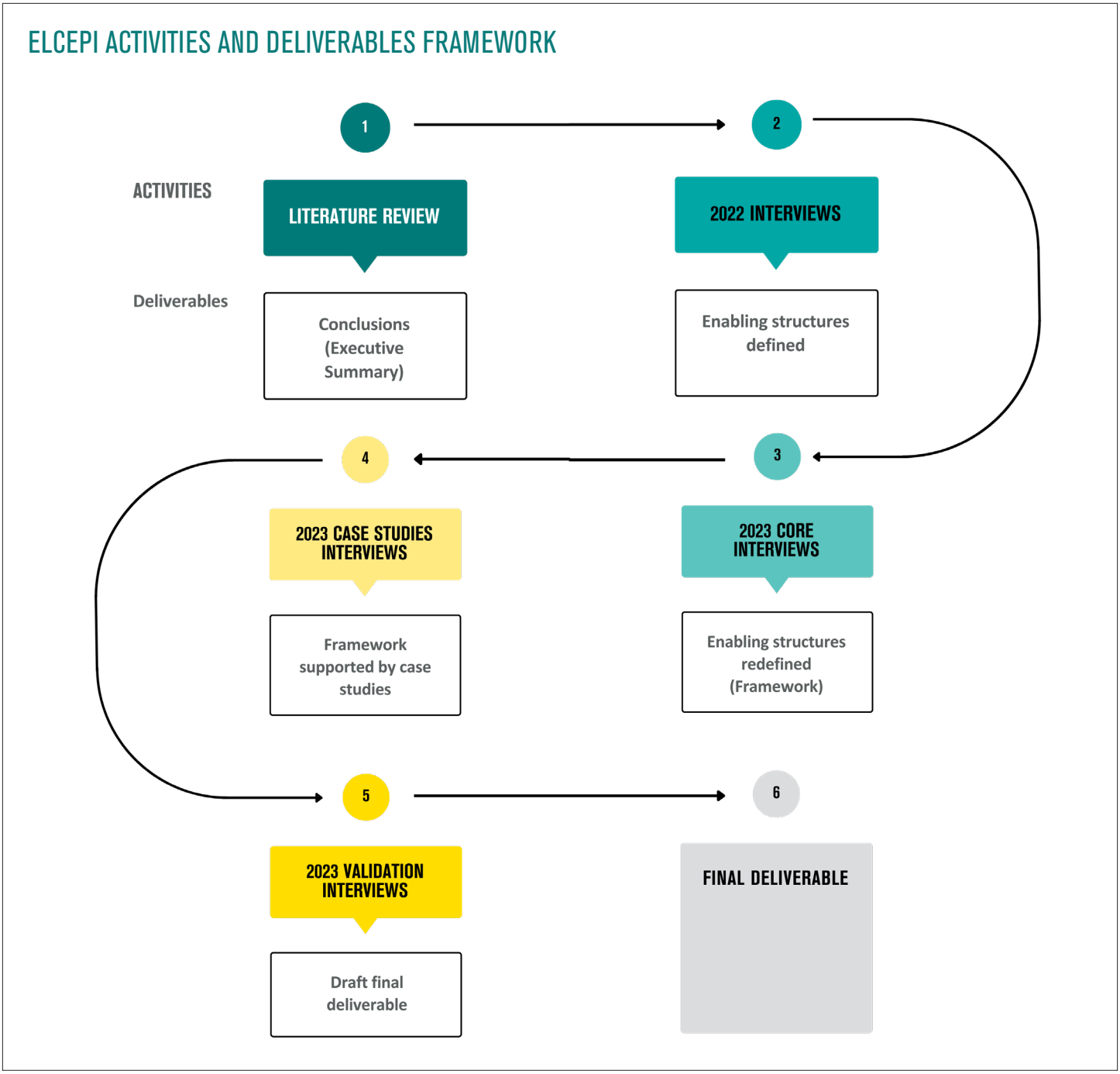
Note: In addition to expediting the capitalization of low-carbon energy projects, the recommendations holistically incorporate principles of Justice, Equity, Diversity, and Inclusion (JEDI).

[1] https://laws-lois.justice.gc.ca/eng/acts/U-2.2/

ACTIVITIES AND DELIVERABLES FRAMEWORK

The following roadmap was followed whereby activities informed and added resolution to the deliverables.

Figure 1: Activities and Deliverables Framework



ACTIVITY 1: LITERATURE REVIEW NARRATIVE REPORT (FINDINGS AND ASSESSMENT)

As a starting point, QUEST Canada undertook a literature review, supported by ad hoc interviews with industry experts, to gain an understanding of the barriers and opportunities relating to low-carbon energy financing. This narrative report summarizes the material reviewed, presents the knowledge gained, and provides a high-level financing architecture for local energy initiatives.

FINANCING ARCHITECTURE

Based on the research analysis, a high-level financing architecture was developed and is described below. The preliminary architecture is an early sketch and should be further refined in parallel with the recommended actions and conclusions of this study.

The financing architecture outlined in Figure 2 focuses on two broad project types and are technology agnostic:

a. Renewable Energy: Including, but not limited to, district heat, community scale wind and solar.
b. Energy Retrofits and Low-Carbon New Builds: Including, but not limited to, demand side management (DSM), distributed energy resources (DER), and deep industrial, residential and commercial retrofits (envelope tightening, heat source swaps, etc.).

Actions, organizations, and mechanisms, identified in Figure 2 are categorized under three broad phases of project progress:

1. **Start-up Phase:** The process of creating an investment-ready project plan involves three broad Start-up Phase actions. These actions, or sub-phases, ensure that the project is prepared for investment by ensuring it is appropriately supported, considers the local context, and is done diligently.

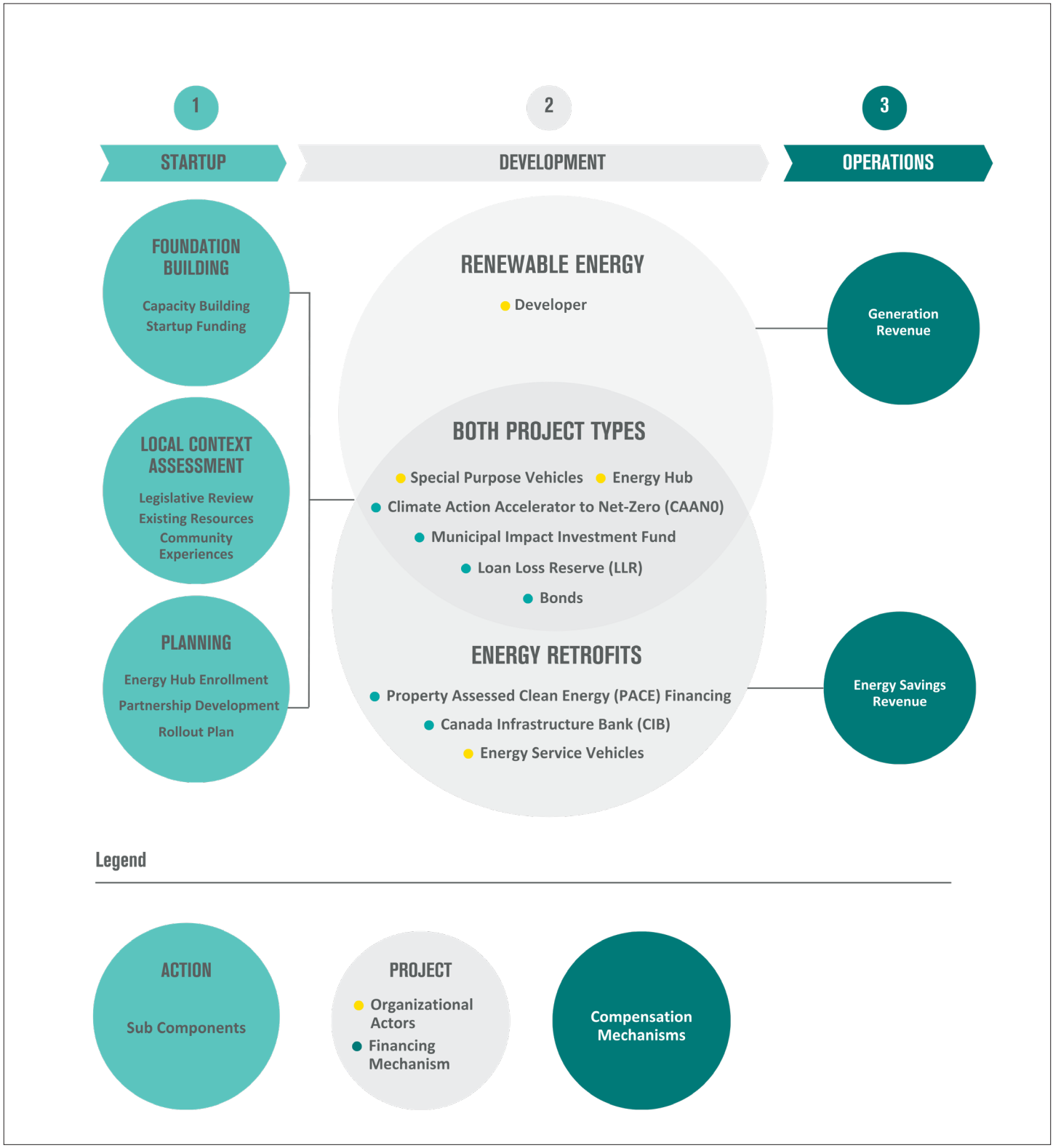
   a. **Foundation Building:**
      i. Capacity Building: Capacity to conceptualize investment-ready projects.
      ii. Start-up Funding: Start-up funding to support said capacity.

   b. **Local Context Assessment:**
      i. Legislative Review: Scan legislative barriers and opportunities. This includes but is not limited to partnership, grid, debt, and equity restrictions.
      ii. Community Experiences: A comprehensive scan of community experiences, which includes understanding the lived experiences of historically marginalized community members. This will ensure the energy plan addresses community inequalities.
      iii. Existing Resources: Leverage existing community initiatives to avoid redundancy and improve efficiency.

   c. **Planning:**
      i. Energy Hub Enrolment: A centralized energy hub supported by local hub chapters would facilitate the planning processes and all other aspects of the Star-tup Phase (and subsequent phases) and should be easily accessible to communities. Indigenous Clean Energy's 20/20 Catalyst[2] and Europe's SUNshINE[3] platform are examples of Enabling Instruments (called Enabling Vehicles or "Hubs") to build off of.
      ii. Partnership Development: Opportunities and barriers inform partnership requirements and opportunities.
      iii. Rollout Plan: Identified parties co-develop a live, but structured rollout plan. Activities include but are not limited to renewable energy resource planning, stakeholder engagement

[2] https://indigenouscleanenergy.com/our-programs/20-20-catalysts
[3] https://sunshineplatform.eu/

Figure 2: Financing Architecture



planning, and creating a capitalization strategy.

2. **Development Phase:** The development phase executes the community energy transition plan for both energy retrofit and renewable energy project types. In this phase, organizational actors and financing mechanisms established in the Start-up Phase are operational. The following entities and mechanisms were flagged as potentially playing a significant role in project capitalization:

    a. Organizational Actors: Developers, Special Purpose Vehicles (SPVs), and Energy Service Vehicles.
    b. Financing Mechanisms: Climate Action Accelerator to Net Zero[4] (CAAN0), Municipal Impact Investment Fund[5], Loan Loss Reserve, Bonds, Property Assessed Clean Energy Financing[6] (PACE), Canada Infrastructure Bank[7] (CIB).

3. **Operations:** During this phase, there exists a streamlined and barrier-free process to generate project revenue, track success, and disburse returns. Indicators of success, such as revenue generating streams, will differ from community to community and are generalized below:

    a. **Generation Revenue:** Power Purchase Agreement (PPA), Feed-in-tariff (FIT), Renewable to Retail (R2R), etc. to be determined at Start-up, based on local context assessment.
    b. **Energy Savings Revenue:** Net Metering, utility billing, etc. to be determined at the Start-up phase, based on local context assessment.

ACTIVITY 2: INTERVIEWS

Interviews were designed to inform the final ELCEPI project deliverable (Recommendations Document by way of Agile Recommendations Document) by building off the Literature Review and Narrative Report. These individuals (and organizations) were selected through a filtering process exercise whereby QUEST Canada short-listed critical interviewees. Interviewees were added based on ongoing research and based on interviewee recommendations.

Five broad interview groups were targeted:

- Local and Senior Governments: Engaging with these stakeholders is crucial for addressing policy and regulatory barriers to low-carbon energy adoption at the local and national levels.
- Energy Service Vehicles and Developers: Engaging with these stakeholders can help identify and address technological and market barriers to low-carbon energy adoption and spur innovation and investment in the sector.
- Investment and Financing: Engaging with these stakeholders is critical for unlocking the capital needed to scale up low-carbon energy solutions and reduce costs.
- Social Benefit Experts: Engaging with these stakeholders can help ensure that low-carbon energy policies and initiatives are designed with equity and social justice considerations in mind and that the benefits of the low-carbon energy transition are shared equitably.
- Individuals With Lived Experiences: Engaging with these stakeholders can help identify and address the real-world barriers and challenges faced by communities in adopting low-carbon energy solutions, and ensure that the low-carbon energy transition is inclusive and equitable.

Three types of interviews were executed:

- Core (~15 Interviews): To critique findings, identify gaps, and propose solutions
- Validation (~20-25 Interviews): To validate and inform the Agile Recommendations Document and pivot design particulars.
- Case Study (4 Interviews): To showcase real-world examples as to where barriers and

[4] https://www.marsdd.com/news/helping-communities-adapt-to-the-ravages-of-climate-change/
[5] https://thesvx.medium.com/social-finance-forum-to-return-in-2023-with-new-partners-fb888136ae17
[6] https://www.pembina.org/pub/pace-financing-canada
[7] https://cib-bic.ca/en/

opportunities exist.

DELIVERABLES

1. **Narrative Report:** The Narrative Report assesses tools explored in the Literature Review, presents the knowledge gained, and provides a high-level financing architecture for local energy initiatives.

2. **Agile Recommendations Document:** A living document outlining barriers and solutions to low-carbon-energy financing conceived from the Narrative Report. Document content was revised upon every interview and ultimately became this document, the Recommendations Report.

3. **Recommendations Report:** The final document, which we originally intended to be a guidebook for communities to develop aggregate projects and unlock capital. Based on the agile methodology of this research, the final document now provides a foundation to connect investments to low-carbon energy projects better while maximizing social benefit and addressing social inequities when and where possible, in lieu of a mapped-out guidebook for communities.

RECOMMENDATION REPORT STRUCTURE

Guided by engagement activities, this ELCEPI Recommendation Document is structured so that:

1. It scratches the surface of an infamous relationship frequently cited throughout interview discussions. That is, Indigenous stewardship and sincere non-indigenous actions towards reconciliation efforts must be addressed in parallel with low-carbon energy financing and are indirectly connected to it. This section unravels the historical and continuous injustices by:

    a. Describing the importance of reconciliation.
    b. Summarizing engagement activities and connecting reconciliation with principles of Justice, Equity, Diversity, and Inclusion.
    c. Highlighting Indigenous-led movements.
    d. Recommending a pathway forward.

2. Reflects stakeholder-informed challenges and opportunities to low-carbon energy financing by phase (Start Up, Development, and Operations). This analysis is presented by:

    a. Describing and grouping dozens of identified barriers into overarching themes.
    b. Presenting jurisdictional and Canada-wide solutions. These resolutions revolve around establishing Enabling Vehicles, or "hubs," and their activities and characteristics.
    c. Highlighting the role established and developing organizational actors and financing mechanisms may play.

PROJECT LIMITATIONS

First and foremost, we acknowledge the limitations of recommendations originating from institutions governed by settlers, including the ones responsible for funding and authoring this study. We understand that relying solely on settler perspectives is inadequate for determining the appropriate action. We want to clarify that we have no interest in seeking credit or personal gain from this endeavour. Instead, we aim to attribute all recognition and gratitude to the Indigenous individuals who have generously assisted us in navigating this study.

When conducting research with a limited budget, capacity, and interview size, it is essential to acknowledge that the findings are not all-encompassing. Despite allocating a significant amount of resources to engaging interviewees, the pool was shallow, despite being wide. Furthermore, it is essential to acknowledge that opinions and perspectives can vary even within small groups and sub-sections of populations. Additionally, the conclusions are generalized when not all variables are considered, such as being project and province agnostic. Critical

factors that enable or challenge low-carbon energy capitalization may not be captured.

Furthermore, it is vital to remember that such studies aim to lay the groundwork and build a foundation for future research and action. By acknowledging these limitations, the audience of this work must interpret and act on the findings to better add resolution to enabling low-carbon energy structures and act swiftly and sincerely regarding Indigenous reconciliation.

INDIGENOUS STEWARDSHIP, RESILIENCE, INSPIRATION AND A HUMBLE APOLOGY

CART BEFORE THE HORSE - LOW-CARBON CAPITALIZATION BEFORE RECONCILIATION

The need to transition away from a carbon-intensive economy to preserve planetary health is well documented. However, the barriers to capitalizing low-carbon energy projects, compiled in this study, are rooted in colonialism. Thus, a recurring topic of discussion throughout QUEST Canada's research focused on addressing systemic inequities provoked by settler institutions and governing policy. Interviewees and literature advise an immediate paradigm shift in settler and Indigenous relations to address historic and sustained injustices.

Such a regime change will ultimately curb climate change. Still, non-Indigenous individuals have a broader obligation to humbly acknowledge wrong-doings, genocide, appropriation, and an overarching disregard for Indigenous views. There are pockets of improved and thriving non-Indigenous and Indigenous relations; however, transformative efforts must be expedited. The Métis Crossing[8] Solar Project provides evidence of such collaboration; however, many Indigenous-led low-carbon energy projects[9] are siloed in their interface with neighbouring settler communities.

Countless Indigenous communities and organizations are successfully deploying low-carbon energy projects centered on community needs, providing tangible benefits despite disadvantages imposed by historical injustices and project siloing. Such evidence of resilience, paired with research and interviews linking Indigenous-led low-carbon energy initiatives with community values and cultural teachings, suggest settler societal structures are best guided under Indigenous leadership. Thus, supporting Indigenous-led "Land Back[10]" movements are necessary to catalyze a systemic shift towards just societal and economic value systems, which includes stewardship over energy models, systems, governance, and financing.

The significance of reconciliation and the effort required to restore Indigenous conservancy over so-called Canada and across settler borders go well beyond the scope of work for this project. However, the research and interviewees almost unanimously point towards rectifying historic wrongs before developing structures that enable the capitalization of low-carbon energy projects and developing solutions to the barriers defined in this report through the lens of Indigenous views and decolonized structures.

The following summarizes engagement discussions which steered us towards showcasing the Land Back movement. The central pillar of all recommendations in this report revolve around further exploring and quickly acting on the Land Back[11] movement. Thus a snippet of what Land Back means and how it can be applied is also described below.

INDIGENOUS-RELATED STAKEHOLDER ENGAGEMENT SUMMARIZED

During this project's stakeholder engagement planning exercise, Indigenous relations were a primary focus. Initially, discussions with diverse stakeholders centred around the opportunities and challenges facing Indigenous communities concerning low-carbon energy financing and collaboration opportunities. As the project progressed, there was a shift toward incorporating Indigenous perspectives into non-Indigenous societal structures and institutions. This led to conversations around the intersection of Indigenous ways of life and principles of Justice, Inclusion, Equity, and Diversity (JEDI). Ultimately, the discussions evolved to include reconciliation efforts and acknowledging the historical injustices Indigenous communities face, culminating in conversations around Land Back.

[8] https://www.smokylakecounty.ab.ca/p/m-tis-crossing-solar-project
[9] https://davidsuzuki.wpenginepowered.com/wp-content/uploads/2022/05/DSF-CPP-Indigenous-Engagement-Report-2022.pdf
[10] https://4rsyouth.ca/land-back-what-do-we-mean/
[11] https://landback.org/

> "NEED TO BE IN THE DRIVER'S SEAT RATHER THAN A PASSENGER. IT'S TIME TO END THE RENT-A-FEATHER TOKEN APPROACH. WE NEED MORE EQUITY AND SEATS AT DECISION-MAKING TABLES"

Guy Lonechild, First Nations Power Authority.

> "WE MUST TAKE BACK OUR LAND AND ENSURE IT STAYS HEALTHY FOR THE LONG HAUL. THAT MEANS LOOKING AFTER THE ENVIRONMENT AND MAKING SURE EVERYONE BENEFITS FAIRLY FROM IT, NOW AND IN THE FUTURE"

Samantha Steves, an inspiring and resilient urban Indigenous advocate who has faced settler oppression.

> "COLONIZATION HAS DESTROYED AND IT'S GENOCIDAL"

Tara Zep, a beacon of hope for those who have struggled against adversity to achieve their goals.

Informed by the preceding topics of discussion, this document outlines the following keynote considerations: Indigenous low-carbon energy, reconciliation, and JEDI (Justice, Equity, Diversity, and Inclusion) principles; Indigenous-led and ally-supported Land Back; strategies for accelerating action; building off resilience and successes; and practical next steps.

KEYNOTE CONSIDERATIONS: INDIGENOUS LOW-CARBON ENERGY, RECONCILIATION, AND JEDI (JUSTICE, EQUITY, DIVERSITY, AND INCLUSION) PRINCIPLES

- The low-carbon energy transition is a once-in-a-lifetime opportunity that should be led by individuals and communities who have been living low-carbon lives and preserving ecosystems for millennia, particularly Indigenous communities. The transition to low-carbon energy and broader reconciliation efforts between Indigenous and settler communities are closely linked as they are both based on outcomes of preservation, both ecologically and culturally.
- However, the principles of Justice, Equity, Diversity, and Inclusion (JEDI), including Indigenous empowerment, must be integrated into the transition planning and implementation process. Several important energy stakeholders stated that they lacked expertise in JEDI principles and Indigenous stewardship; therefore, they could not publicly comment on these matters within their area of expertise. They understood, however, that initiating a low-carbon energy transition on the same colonial and unfair basis as the current energy industry would simply exacerbate existing disparities. To guarantee a just and equitable conclusion, it is necessary to apply JEDI principles to the transition process. The principles of Energy Poverty[12] serve as a prime illustration of the JEDI principles tailored to the low-carbon energy domain.
- The increasing trend of unaffordable housing and energy highlights the urgent need for a paradigm shift in all socio-economic

[12] https://energypoverty.ca/

sectors, including the energy sector. Funding streams and capitalization strategies for non-Indigenous and Indigenous communities differ significantly. However, the planning requirements for both are very similar.

- There is very little collaboration between Indigenous communities and neighbouring non-Indigenous governments. Indigenous representation is also lacking on many utility review panels and other decision-making structures. Large crown public utilities tend to seek out communities with the capacity to carry out projects, but many Indigenous communities lack the necessary capacity.
- Overall, ensuring that Indigenous perspectives and voices are central to the low-carbon energy transition and that JEDI principles are integrated throughout the process is crucial. Collaboration and representation are key to building a sustainable, equitable, and just low-carbon energy future for all.

PATHWAY FORWARD

- Non-Indigenous governments, organizations, and individuals must humbly acknowledge the injustices of colonialism and the climate predicament it has placed us in. "The path towards reconciliation will be uncomfortable for settlers, but nothing compared to the lived experiences of residential school survivors," says Mi'kmaq Elder Bernadette.
- Exploring the concept of Land Back is less "scary" than many people may initially think. This involves returning land ownership and governance to Indigenous peoples, who have a deep connection to the land and have been stewards of it for generations.
- Many individuals who support the Land Back movement may hesitate to comment on how it could play out as they may not consider themselves experts. Nonetheless, they support the movement in principle and recognize the importance of Indigenous sovereignty over their traditional lands.
- It is essential to continue these conversations and efforts towards reconciliation and Land Back, as they represent critical steps towards healing and righting the wrongs of the past. This will require ongoing collaboration, listening, learning from Indigenous peoples, and recognizing Indigenous rights to self-determination and self-governance over their lands and resources.

INDIGENOUS-LED AND ALLY-SUPPORTED LAND BACK

Despite appearing outside the scope of the initial research, the findings leading up to this point have pivoted the research toward exploring the concept of Land Back. The Land Back movement has the potential to act as an enabler to accelerate low-carbon energy deployment that aligns with the principles of Justice, Equity, Diversity, and Inclusion. However, this outcome is just one of the many potential benefits of Land Back, and the movement's central focus goes much deeper.

The movement towards Land Back is largely untested, multi-faceted, and requires a deep understanding of Indigenous sovereignty, governance, and connection to the land. This understanding is critical to recognize the importance of returning land ownership and governance to Indigenous peoples, allowing them to steward the land and resources in a way that aligns with their cultural practices and beliefs.

The potential benefits of Land Back are vast, and it is the right thing to do. It is crucial to engage in conversations and actions toward reconciliation, listen to Indigenous peoples' voices, and recognize their rights to self-determination and self-governance over their traditional lands. Only through these efforts can Canada fully understand the potential of Land Back and work towards building a sustainable, equitable, and just future for all. Land Back is introduced below by definition, inspiring stories that capture cultural resilience, and considerations to mobilize action.

DEFINITION

Although definitions from Land Back activists and supporters differ in terms of language, the core concept "revolves around a peaceful, humble, and honest acknowledgement of past wrongdoings, and actions at all levels of government and institutions, within so-called Canada and across settler defined borders to restore Indigenous oversight of lands, water and our connections to it. It's stolen land, abused land, and it's time for that to change," Samantha Steves. A few alternative definitions and considerations are presented here:

- "Non-Native people, both those for and those against Indigenous resistance, often oversimplify our struggle as being just about who owns the land, whether it belongs to Canada or our Peoples. But just as importantly, it's about how the land is owned – how we relate to it, how we relate to each other through it, and who 'we' are as Indigenous Peoples."[13]
- "In settler-colonial societies, land appears as an immense accumulation of property titles. To traditionalist Indigenous Peoples, in contrast, land is not a thing in itself but a social relationship between all living and non-living beings."[14]
- "The need to restore healthy relations challenges the imposed structure of the colonial system. Our relations need space on which to unfold – that is, our lands, water, and clean air. When we say Land Back, we also mean Relations Back."[15]
- "Land is the terrain upon which all our relations play out, and it can even be seen as a living thing itself, constantly shaping and being shaped by other life forms. Land isn't just a place, it's also a territory, which implies political, legal, and cultural relationships of jurisdiction and care."[16]
- "When we say 'Land Back' we aren't asking for just the ground, or for a piece of paper that allows us to tear up and pollute the earth. We want the system that is land to be alive so that it can perpetuate itself, and perpetuate us as an extension of itself. That's what we want back: our place in keeping land alive and spiritually connected."[17]
- "Land Back must include the liberation of Black people." [18]

HOW TO ACCELERATE ACTION

When people's fundamental needs are satisfied, they are in a better position to contribute to the cause of Land Back. Thus, focusing on social objectives that prioritize the necessities of Indigenous communities and Urban Indigenous people, such as affordable housing, mental health service accessibility, harm reduction, and fair wages, will accelerate Land Back.[19]

To promote stronger settler and Indigenous relations, it would be beneficial to secure funding and expand awareness programs such as the Indigenous Cultural Competency[20] offered by the Native Canadian Centre of Toronto while making them a mandatory credential for employees in various sectors, and certainly ones discussed in this study. These hands-on-based learning programs provide engaging teachings focused on today's Indigenous culture and how historical and current experiences shape misinformed views of Indigenous people. TREC Renewable Energy Cooperative[21] has hosted such workshops in the past as a means to build Indigenous awareness for its employees. Former employee, Lav Zhang, noted that these teachings are "forever engraved in our minds and hearts. I've shared what I took away from it with friends and family."

"Ultimately, the success of Federal reconciliation efforts

[13] https://briarpatchmagazine.com/articles/view/land-as-a-social-relationship, Mike Gouldhawke
[14] https://briarpatchmagazine.com/articles/view/land-as-a-social-relationship, Mike Gouldhawke
[15] https://briarpatchmagazine.com/articles/view/land-as-a-social-relationship, Mike Gouldhawke
[16] https://briarpatchmagazine.com/articles/view/land-as-a-social-relationship, Mike Gouldhawke
[17] https://briarpatchmagazine.com/articles/view/what-is-land-back-a-settler-faq, Brooks Arcand-Paul, Nickita Longman, David Gray-Donald
[18] https://briarpatchmagazine.com/articles/view/land-back-means-protecting-black-and-indigenous-trans-women, Jaye Simpson
[19] https://briarpatchmagazine.com/articles/view/what-is-land-back-a-settler-faq, David Gray-Donald
[20] https://ncct.on.ca/indigenous-cultural-competency-training/
[21] http://Trec.on.ca

depends on the political will of current leaders and bureaucracies. Unfortunately, this political will seems to be lacking, so progress on reconciliation is slow, even in areas where Calls to Action have been completed."[22]

BUILD OFF RESILIENCE AND SUCCESSES

"As Indigenous Peoples, we have never completely lost our connection to our lands and waters, nor our collective understanding of ourselves as Peoples, despite Canada's ongoing violent occupation of our territories, repeated displacements of our communities, and various attempts to assimilate us into its political and economic order."[23] Indigenous resilience, as defined by Mike Gouldhawke, has not gone unnoticed and should inspire and give confidence to policymakers, senior levels of government, and all individuals, that Land Back is in good hands with land and water defenders.

ALLY SUPPORT

> "ALLIES OF INDIGENOUS PEOPLES SHOULD EDUCATE THEMSELVES AND EACH OTHER."

Jesse Wente.[24]

In settler-colonial societies, land is typically perceived as a commodity through the lens of property titles. However, for Indigenous Peoples, land holds a much deeper significance as it encompasses culture, relationships, ecosystems, social systems, and spirituality. As a result, when formal channels such as colonial court systems fail to protect Indigenous land, resorting to direct action becomes a recurrent practice.[25]

Despite this connection to land and preservation, there tends to be settler hesitation to act on Land Back promptly. Efforts that showcase Indigenous resilience and a deep connection to ecological preservation for the benefit of present and future generations underpin the rationale for Indigenous stewardship over land. Disseminating examples, such as the ones below, will help persuade the vast majority to adopt supporting perspectives.

IDLE NO MORE

A social and political movement that originated in Canada in 2012. The movement was initiated by four women, three First Nations women and one non-Indigenous ally, responding to the Canadian government's introduction of the Omnibus Bill C-45, violating treaty rights and Indigenous sovereignty. The movement focuses on Indigenous sovereignty, environmental protection, and cultural revitalization.[26]

ELSIPOGTOG MI'KMAQ COMMUNITY BLOCKADE

The Elsipogtog Mi'kmaq community and allies gathered in a blockade to oppose hydraulic fracking, the shale gas industry, and the lack of Indigenous consultation. These efforts emphasized "that decisions made about the land today should be weighed for their effect on the land tomorrow".[27]

MI'KMAQ OPPOSES NATURAL GAS

Mi'kmaq grandmothers won their fight against the Alton Gas project in Nova Scotia through a combination of legal challenges, protests, and direct action. Their sustained campaign drew attention to the environmental risks of the project. It asserted treaty rights and sovereignty, ultimately forcing the Nova Scotia government to require further assessments and consultations before proceeding with the project.[28]

22 https://yellowheadinstitute.org/wp-content/uploads/2022/12/TRC-Report-12.15.2022-Yellowhead-Institute-min.pdf
23 https://briarpatchmagazine.com/articles/view/land-as-a-social-relationship, Mike Gouldhawke
24 https://davidsuzuki.org/what-you-can-do/what-is-land-back/
25 https://indigenousfoundations.arts.ubc.ca/community__politics/
26 https://dailyutahchronicle.com/2020/03/09/idle-no-more-movement-a-positive-force-in-canadas-first-nations-community/, Kaitlyn Bancroft
27 https://www.cbc.ca/news2/interactives/a-mikmaq-seat-at-the-table/
28 https://www.theenergymix.com/2021/10/24/victory-for-mikmaq-as-nova-scotias-alton-gas-project-cancelled/

KAHNAWÁ:KE MOHAWK COMMUNITY BLOCKADE

The community stood in solidarity with the Očhéthi Šakówiŋ (Dakota, Nakota, and Lakota) people of Standing Rock, who were blocking an oil pipeline development project with their massive solidarity camp.[29]

TSIMSHIAN NATION'S LELU ISLAND CAMP

The people of the Tsimshian Nation for years resisted the proposed development of a liquid natural gas project, provoking The Prince Rupert Port Authority to ban development around the island in 2019.[30]

WET'SUWET'EN ONGOING DISPUTES

The Wet'suwet'en people opposed the construction of a natural gas pipeline on their traditional territory, stating that they were not adequately consulted about the project and that it violates their rights and sovereignty. The dispute has led to protests, blockades, and arrests, with Indigenous activists and their allies calling for the recognition of Indigenous sovereignty and the protection of Indigenous lands and waters.[31]

SOLIDARITY

Black Lives Matter women organizers join in solidarity with Indigenous people occupying the Toronto offices of Indigenous and Northern Affairs Canada in response to the suicide crisis at the Attawapiskat First Nation, a Mushkegowuk (Swampy Cree) community in northern Ontario.[32]

IN PRACTICE AND NEXT STEPS

Persistent keenness to restore Indigenous conservancy has been noticed, and settler-formed institutions and structures are beginning to realize the importance of doing so. Discussions between SaskPower and Indigenous groups are aligned at balancing the need for energy infrastructure with protecting Indigenous cultural sites and values, signifying a trend towards greater Indigenous involvement in resource management and decision-making in Canada.[33]

While inspiring, decolonizing energy is just a piece to a much larger Indigenous-led and ally-supported paradigm shift that needs immediate attention. A lack of precedent nor a one-size-fits-all playbook makes describing the scope of effort for true reconciliation challenging. What is known is that significant resources need to be reprioritized to reconcile historic wrong-doings, and a humble and honest apology is an easy first step. The following are potential next steps based on discussions and research to date:

1. To ensure that Indigenous perspectives are fully incorporated into decision-making processes, policymakers should also consider engaging with Indigenous-led empowerment and Land Back organizations like the Yellowhead Institute[34]. These organizations play a vital role in advocating for the rights and sovereignty of Indigenous peoples, as well as promoting the revitalization of Indigenous knowledge and practices. Policymakers can enable such activities by providing financial and institutional support while engaging in meaningful consultations with Indigenous communities to better understand the unique perspectives and situations. Ultimately, the goal should be to work towards reconciliation and to build a more just and equitable society that recognizes and respects the rights and sovereignty of Indigenous peoples.
2. From an energy perspective, policymakers should also look towards and support the growth of Indigenous led energy organizations such as Indigenous Clean Energy[35], First Nations Power Authority[36], and the recommendations laid out in the David Suzuki Foundation's Indigenous Engagement Report.[37]
3. Another crucial step towards decolonizing energy and settler structures is to incorporate an approach to resource management akin to the Mi'gmawe'l Tplu'taqnn Inc. (MTI) model.[38] The MTI model offers a holistic approach to management based on the Mi'kmaq concept of Netukulimk, which emphasizes

[34] https://yellowheadinstitute.org/
[35] https://indigenouscleanenergy.com/
[36] https://fnpa.ca/
[37] https://davidsuzuki.wpenginepowered.com/wp-content/uploads/2022/05/DSF-CPP-Indigenous-Engagement-Report-2022.pdf
[38] https://migmawel.org/migmaq-rights-impact-assessment-framework/

Indigenous self-governance, community engagement, and the revitalization of traditional knowledge in decision-making processes. To apply the MTI model in practice, policy makers and industry leaders should engage in meaningful consultation with Indigenous communities, provide financial and technical support for community-led energy projects, and prioritize Indigenous-led research and innovation. Incorporating the MTI model into existing policy frameworks and institutional structures can help ensure that Indigenous perspectives are valued and integrated into decision-making processes, moving Canada towards a more just and equitable energy system that respects Indigenous rights and promotes environmental sustainability.[39]

4. Policy and industry leaders must prioritize Indigenous perspectives and involvement and incorporate traditional ecological knowledge. Without Indigenous knowledge and considerations, the low-carbon energy transition will fail, potentially perpetuating colonial power dynamics and negatively impacting Indigenous peoples' rights to their land and resources. With this in mind, the following are additional factors that policymakers and industry leaders should consider when designing and implementing energy development projects:

    a. The potential impacts of energy development on Indigenous women and girls, as they are often disproportionately affected by environmental harms and gender-based violence.[40]
    b. The role of renewable energy technologies in Indigenous communities and the potential for these technologies to provide sustainable economic opportunities.[41]
    c. The potential for energy development to perpetuate colonial power dynamics and how these dynamics can be challenged or mitigated through the involvement of Indigenous communities in decision-making processes.[42]
    d. The importance of incorporating traditional ecological knowledge into decision-making processes and how this knowledge can inform sustainable energy development practices.[43]
    e. The potential for energy development to impact the rights of Indigenous peoples under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), particularly concerning land and resource rights.[44]

Recognizing the critical role of Indigenous perspectives in project implementation, our study has shifted its central theme towards this topic, as it underpins all aspects of sustainable development and addresses the historical injustices and wrongs towards Indigenous peoples. We understand that the drawbacks of settler-governed institutions have significantly impacted Indigenous peoples, and we recognize that settler perspectives alone are not sufficient to determine the right course of action. Integrating Indigenous knowledge and perspectives is crucial for moving forward in a just and sustainable manner. While the following section highlights the themes related to low-carbon capitalization that we have identified in our study, it is essential to note that this is just one aspect of the larger conversation on Indigenous engagement and sustainable development.

[39] https://www.cbu.ca/indigenous-affairs/migmawel-tplutaqnn-inc/
[40] "Missing and Murdered Indigenous Women and Girls in Canada." National Inquiry into Missing and Murdered Indigenous Women and Girls, 2019
[41] "Indigenous Clean Energy Social Enterprise: A National Strategy." Indigenous Clean Energy, 2020
[42] "Indigenous Peoples and the Energy Sector in Canada: Towards a Better Understanding." National Energy Board, 2017
[43] "Guidelines for Considering Traditional Knowledge in Climate Change Initiatives." Assembly of First Nations, 2018
[44] "Implementing the UN Declaration on the Rights of Indigenous Peoples: Priorities, Partnerships, and Next Steps." Indigenous Clean Energy, 2020

INTRODUCTION TO BARRIERS, RESOLUTIONS, ORGANIZATIONAL ACTORS, AND FINANCING MECHANISMS

INTRODUCTION

Project capitalization is influenced by region-dependent factors, such as regulatory differences, community debt, and resource availability. We conducted formal, ad hoc, and validating interviews with stakeholders from the energy and social sectors, including those with challenging lived experiences, to gain insight into three broad phases of project capitalization. These discussions informed the findings. This research is not exhaustive but provides a framework for policymakers to act on and prioritize. We focus on identifying barriers and highlighting key factors contributing to potential solutions. This introduction section:

- Re-introduces the low-carbon project phase
- Introduces the eight barriers to low-carbon capitalization
- Summarizes how solutions are implemented (locally and centrally)
- Describes what is meant by organizational actors and financing mechanisms
- Finally, this introduction concludes by describing how each phase of the project has been analyzed using an analytical framework

INTRO TO PROJECT PHASES

The following project phases are loosely defined, as they overlap and lack fixed start and end points, and are subject to unique variables for each project. Nevertheless, these generalizations provide a project framework consisting of a beginning, middle, and end. Stakeholder conversations have informed the identification of these phases, which allows us to focus on and resolve challenges to achieve the following milestones for each phase: (1) Investment readiness, (2) Funding and development, and (3) Operations and achievement of goals.

1. **Start-Up Phase:**
   a. Start-Up Phase - Foundation Building: Building and securing community capacity and funding to conceptualize investment-ready projects.
   b. Start-Up Phase - Local Context Assessment: A regional assessment of project enabling legislation, examining community experiences, including the lived experiences of historically underrepresented community members to best address inequalities, and leverage existing community resources.
   c. Start-Up Phase - Planning: Securing partnerships and contracts and co-developing an investment-ready rollout plan (resource studies, financial modelling, etc.)

2. **Development Phase:** The development phase executes the communities energy transition plan for both energy retrofit and renewable energy project types. Organizational actors and financing mechanisms established in the startup phase are now operational.

3. **Operations Phase:** During this phase, the project is operational, generating revenue, indicators of success are tracked, and paybacks (i.e. returns on investment) are processed.

INTRO TO BARRIER THEMES

Dozens of barriers were identified, analyzed and categorized into the eight themes presented below. Many of the individual barriers spanned multiple phases and themes, but for this exercise, barriers were cataloged under the closest correlated theme.

1. **Funding:** Limits the availability of financial resources necessary for the project and achieving its objectives.

2. **Policy:** Imposes regulatory requirements and restrictions or creates uncertainty that may increase project costs, delay timelines, or make the project unfeasible.

3. **Networking Inadequacies:** Limits access to key stakeholders, expertise, or resources necessary for successful project implementation.

4. **Prioritizing Social Returns:** Requires a trade-off between achieving financial profitability, and/or

disrupting the status quo and maximizing social impact.

5. **Programmatic Challenges:** Introduces complexities in project design and implementation, such as connecting project objectives to outcomes, coordinating multiple stakeholders, or integrating various project components.

6. **Capacity:** This limits the ability of stakeholders to effectively plan, execute, and monitor the project due to a lack of expertise, resources, or institutional support, which may result in project failure or underperformance.

7. **Governance:** This creates issues related to decision-making, accountability, or corruption that may reduce investor confidence, impede project progress, increase costs, and ultimately hinder the project's success.

8. **Risk:** Introduces uncertainty and potential adverse outcomes that may discourage stakeholders from investing time, money, or resources.

INTRO TO CENTRAL AND LOCAL RESOLUTIONS

The report presents resolutions to resolve barriers to community energy projects. However, it is essential to note that these resolutions are not exhaustive and require further refinement and testing of assumptions and conclusions. Despite this limitation, opportunities to overcome all eight identified barriers in the five phases of a community energy project were identified. Conceptually, the solution would require an Enabling Vehicle (sometimes referred to as Enabling Structures or "Hubs").

Enabling Vehicles currently exist, but their purview varies from highly specialized services to offering a vast range of project related resources. They take shape as various structures from Efficiency Utilities to non-profit and for-profit organizations to Federations of co-operatives. Developing an Enabling Vehicle does not follow a standard approach. Still, the identified barriers suggest that Enabling Vehicle purviews can be divided into two segments:

- A local Enabling Vehicle (LEV) executes local resolutions to barriers and acts as a "one-stop-shop" for communities within its jurisdiction, widening opportunities and removing barriers.
- A Central Enabling Vehicle (CEV) executes central resolutions to barriers and acts as a "one-stop-shop" to the LEV widening opportunities and removing barriers.

Further work is necessary to determine how the Central and Local Enabling Vehicles can execute the functions identified here. The rollout, identity of the Enabling Vehicle, and the details of how it operates are not within this project's scope. Nevertheless, they will help communities launch projects by providing services such as navigating opportunities, sharing resources, and advocating for new opportunities.

INTRO TO ORGANIZATIONAL ACTORS AND FINANCING MECHANISMS

Various entities and tools, from tangible stakeholders to hypothetical organizations, funding streams, and legal structures, are evolving globally to mobilize low-carbon energy projects. Our research and stakeholder engagement discussions have identified innovative and traditional financing mechanisms and organizational actors, and we have summarized the key topics that emerged from our discussions with stakeholders.

These topics highlight the potential, deficiencies, and ability to provide social benefits, among other important considerations aligned with our study objectives. We have presented these topics concisely, organized by project phase to ensure they are placed in the most appropriate context. It is important to note that these topics may vary by phase. We have prioritized those most relevant and significant for each phase of the low-carbon energy project. The list is not

exhaustive and varies in detail, but it provides a valuable foundation for future refinement.

REPORT STRUCTURE BY PROJECT PHASE

To help readers navigate and understand the report's contents, the skeleton below explains the structure that will be used and populated for all five low-carbon energy project lifecycle phases.

1. **Project Phase**
    a. Barrier Themes: Describes barriers specific to each project phase (Barrier Theme: a) and identifies additional barriers that overlap across themes (Barrier Themes: x, y), resulting in multiple barrier sections per project phase.
    b. Local Resolutions: Actions that can be taken locally to resolve or mitigate barriers.
    c. Central Resolutions: Actions that can be taken centrally to resolve or reduce barriers.
    d. Connected Organizational Actors and Financing Mechanisms: These are tangible components of real-world structures that gained significant interest among interviewees. In this section, we describe specific attributes related to organizations and financial structures concerning the project phases, barriers, and resolutions, or simply as an additional angle to consider.

START-UP PHASE: FOUNDATION BUILDING

Foundation building involves establishing the necessary capacity, systems, and funding to conceptualize or scale community low-carbon energy projects. These building blocks can then execute the rest of the Start-Up Phase activities, such as detailed planning and exploring the local context of the community. Without a solid foundation that encompasses these and other necessary components, community energy projects may struggle to achieve their goals and face significant challenges in the long run.

START-UP PHASE: FOUNDATION BUILDING BARRIER THEMES - CAPACITY, FUNDING, RISK, POLICY, AND NETWORKING INADEQUACIES

At the local level, pooling funds and projects are difficult due to limited capacity, time, and coordination. Moreover, establishing startup capacity is challenging due to insufficient financial support—creating a chicken-and-egg dilemma. While SOFIAC[45], an innovative investment solution for building retrofits, currently funds pre-development costs, they state Energy Service Vehicles typically don't (and may even) move away from this practice. Natural Resources Canada[46] (NRCan) provides development funds up to 75%. Still, the application process requires significant effort, and there are no immediate returns, making it necessary for project hopefuls to have sufficient funds to apply and continue to seek grant funding should they not succeed. Neither of the abovementioned funding streams covers capacity building for the project's conception, which puts project champions at significant risk during the early stages of project inception. In addition, the complex legal and legislative landscape poses a significant capacity constraint, and many are unsure of where to begin or whom to approach for assistance. The bureaucratic procedures to secure and report on funding exacerbate the discussed challenges if funding is available and received.

START-UP PHASE: FOUNDATION BUILDING BARRIER THEMES - PRIORITIZING SOCIAL RETURNS

Projects that prioritize historically underrepresented or disadvantaged communities alongside low-carbon development often fail to receive adequate attention. Unfortunately, funding stakeholders often overlook the social benefit of prioritizing these projects due to a lack of structures highlighting the value of doing so. As a result, projects that prioritize social empowerment are often overshadowed by revenue-generating "green" projects that primarily focus on environmental benefits.

START-UP PHASE: FOUNDATION BUILDING BARRIER THEMES - LOCAL RESOLUTIONS

To support community-driven low-carbon energy projects, it is recommended to embed capacity within the community or outsource the task to identify funding opportunities. This may involve applying for grant funding or securing start-up funding on behalf of the community. It is important to recognize potential projects, gather aggregation possibilities, explore funding and financing opportunities that can be stacked (layered financing) and identify any legislative barriers that may impede progress.

Regional subject experts should reach out to communities just getting their projects off the ground to fulfill or source project capacity, as well as those who have not considered larger-scale projects, such as small communities. A Local Enabling Vehicle should

[45] https://sofiac.ca/
[46] https://natural-resources.canada.ca/home

also source social funding opportunities to stack with low-carbon focused investments, such as Canada Mortgage and Housing Corporation's (CMHC) National Housing Strategy[47] funds. Understanding the local context of a community will allow project developers to source funding that addresses the community's social inequities.

A Local Enabling Vehicle should advocate or publicize the costs (social and financial) community members incur should access to basic needs worsen, and promote benefits of community togetherness via outreach exercises to help mobilize solutions. "We're struggling to pay rent, and our energy bills are in the arrears. We're wasting so much money on short-term loans. If anything, the absurd interest rate fees we pay on cash advances should be put towards more affordable housing units and services to help us get out of poverty. I don't know why nobody is looking at the root causes of homelessness and inequity. Why should people who can afford energy and housing also benefit from low-interest rates and investment opportunities?" Trish P., a single mother of three, self-identifying as living in energy poverty, living in a two-bedroom apartment.

START-UP PHASE: FOUNDATION BUILDING BARRIER THEMES - CENTRAL RESOLUTIONS

Firstly, advocacy efforts should focus on eliminating unnecessary red tape and establishing direct channels between communities, Local Enabling Vehicles, and funding sources. Additionally, a central forgivable loan fund (funds that do not have to be repaid as long as certain conditions are met) should be created to provide financial support without imposing any return expectations.

To ensure effectiveness, a reputable coordinating team should oversee the deployment of funds to trusted partners and communities. This will streamline the process and expedite the distribution of resources.

Moreover, addressing Environmental, Social, and Governance (ESG) ratings deficiencies needs to be prioritized. This includes improving data collection and risk assessment practices to attract more investors. However, these efforts should not create more bureaucratic obstacles for social projects. Therefore, a Central Enabling Vehicle could evaluate each project on a case-by-case basis, assist with rating approval, and promote impact outcomes centred around principles of Justice, Equity, Diversity, and Inclusion and investor engagement activities.

START-UP PHASE: FOUNDATION BUILDING BARRIER THEMES - CONNECTED ORGANIZATIONAL ACTORS AND FINANCING MECHANISMS

PROJECT OWNERSHIP ENTITY AND ARM'S LENGTH ENTITIES

Municipalities in Canada encounter obstacles in creating low-carbon energy projects, which can be attributed to limited financing options, regulatory hurdles, and a lack of technical expertise. However, there are funding opportunities through senior government bodies that are accessible to those who submit funding applications, but this process can be resource-intensive upfront. To address this issue, Municipalities can explore alternative models and partnerships with non-profits and co-ops with member ownership and technical support. However, in some regions, partnership restrictions exist whereby Municipalities must own 100% of the projects they invest in and may have restrictions to Arm's Length and Project Ownership Entities. Finally, borrowing is limited to Provincial Municipal Finance Entities, which has its constraints.

[47] https://www.cmhc-schl.gc.ca/en/nhs

LOAN LOSS RESERVES AND FORGIVABLE LOANS

A loan loss reserve is a financial tool that sets aside a portion of funds to cover any losses that may occur due to defaulted projects. This reserve can benefit community energy projects by providing developers with access to capital to cover planning, project conception, financial model development, and resource studies. It can reduce the financial burden on the community and make previously infeasible projects a reality. Additionally, forgivable loans can attract private investment by reducing risk and offering minimal contingencies should the project default.

FEDERAL AND REGIONAL FUNDING

There are funding opportunities for Start-Up Phase activities provided by NRCan, Infrastructure Canada[48] (IC), Atlantic Canada Opportunities Agency[49] (ACOA), Federation of Canadian Municipalities[50] (FCM), Capital Grants Program[51](Manitoba), and other Federal, Provincial and regional funding streams. While valuable, these funds need to be restructured to broaden accessibility and may themselves be risk-averse to the point of withholding funds.

CENTRAL AND LOCAL PUBLIC SERVICE ORGANIZATIONS

CMHC affordable housing programs and other central and local affordable housing organizations, such as Tawaak Housing Association[52] and Provincial non-profit housing organizations (e.g. Ontario Non-Profit Housing Association[53]), can support Foundation Building by sharing resources and providing access to funding opportunities. This can include sharing best practices, expertise, and networks to help the community access a variety of funding sources, such as government grants, low-interest loans, and private investment.

On the energy side, non-profit service organizations like the Community Energy Association[54] in British Columbia and Sustainable Waterloo Region[55] in Ontario support local or Provincial governments and communities to advance sustainable energy initiatives.

[48] https://www.infrastructure.gc.ca/index-eng.html
[49] https://www.canada.ca/en/atlantic-canada-opportunities.html
[50] https://fcm.ca/en/news-media/news-release/new-poll-canadians-trust-Municipal-governments-most-deliver-better-qualityhttps://fcm.ca/en/news-media/news-release/new-poll-canadians-trust-Municipal-governments-most-deliver-better-qualityhttps://fcm.ca/en/news-media/news-release/new-poll-canadians-trust-Municipal-governments-most-deliver-better-qualityhttps://fcm.ca/en/news-media/news-release/new-poll-canadians-trust-Municipal-governments-most-deliver-better-qualityhttps://fcm.ca/en/news-media/news-release/new-poll-canadians-trust-Municipal-governments-most-deliver-better-quality
[51] https://www.gov.mb.ca/acsc/large-capital.html#:~:text=Provincial%20Contribution,50%25%20of%20eligible%20project%20costs
[52] https://tawaakhousing.org/
[53] https://www.onpha.on.ca/
[54] https://www.communityenergy.ca/
[55] https://www.sustainablewaterlooregion.ca/

START-UP PHASE: LOCAL CONTEXT ASSESSMENT

A Local Context Assessment is the process of analyzing the local environments and community circumstances that surround a particular situation (e.g. Is energy poverty a community priority?) and involves examining the immediate context, such as the legislative surrounding (e.g. energy production and distribution sovereignty restrictions) local deficits, and existing local resources that can inform and support the situation at hand. Communities can make more informed project planning decisions by considering the local context.

START-UP PHASE LOCAL CONTEXT ASSESSMENT: BARRIER THEMES - NETWORKING INADEQUACIES, GOVERNANCE AND RISK

To ensure the success of any community project, understanding the local context is critical. However, this can be a challenging and resource-intensive process, particularly for communities with limited access to project development capacity. Moreover, existing organizations that support regional experiences are often overlooked when planning community energy projects. This is why it is essential to connect with these organizations and leverage their community connections to achieve goals and develop efficiencies in collaboration rather than competing for funding or creating redundancy in service delivery.

To expedite project decisions that align with a community's needs, opportunities, and challenges, it is crucial to establish a well-informed governance structure with fast-acting steering committees and structures to inform and pivot project design. However, the logistics and best practices required to create such structures are not always well understood, and many communities lack the necessary resources to execute them effectively.

Additionally, community decision-makers' stability and risk tolerance, such as councils or local champion organizations, must be considered when developing projects. Risk tolerance changes and volatile political agendas often stall project capacity and momentum. Therefore, it is important to consider all stakeholders' needs and perspectives and establish clear communication channels to ensure successful project implementation.

START-UP PHASE: LOCAL CONTEXT ASSESSMENT BARRIER THEMES - PRIORITIZING SOCIAL RETURNS AND PROGRAMMATIC CHALLENGES

In the face of a climate emergency and growing social inequalities, communities must have access to up-to-date information and resources that enable them to access financing and take advantage of new opportunities. However, the rapidly changing energy and social landscape can be overwhelming, and communities may lack the capacity to fully understand innovative technologies, financing models, and programmatic challenges. This can lead to underutilization of resources in such communities and broadens the equity gap should communities with the resources tap into such tools.

When awarding funding for low-carbon energy projects, energy funding programs often fail to consider communities' unique circumstances and limitations. This can result in a lack of clarity and direction for low-carbon energy initiatives in these communities, leading to uncertainty and frustration among community members. To address this problem, funding programs need to become more responsive to the needs of local communities and provide the necessary resources to enable them to develop the skills and knowledge required to take advantage of new opportunities. This could involve providing education and training resources, technical assistance, and governance and project development support. By empowering communities to understand and embrace

new technologies and models, we can ensure that the benefits of low-carbon energy are shared more widely and equitably.

Communities often perceive the application of a social lens to low-carbon projects as redundant, as these projects inherently provide social benefits. However, there is an opportunity for low-carbon energy structures, including financing vehicles, to serve as proof of concept for other sectors. Despite the potential for low-carbon energy projects to provide more justice, equity, diversity, and inclusivity outcomes, "there is currently a lack of opportunities to truly strengthen the equity lens to allow for energy democracy." Tynette Deveaux, Sierra Club.

Financing obstacles pose a major challenge during the initial phases of low-carbon energy projects, especially for smaller communities that lack economic development and social support systems. One significant factor affecting such communities are Debt Service Ratio implications on Municipal borrowing, which can lead them to opt out of low-carbon programs. To address these challenges, it is crucial to understand inflation and the cost of capital at the community level. Communities can also explore aggregation opportunities to enable economies of scale and reduce project costs.

However, many communities that need specialized planning and financing assistance often lack the necessary resources and expertise. In particular, limited structures are in place for sharing these specialized skills with communities that lack such knowledge. Consequently, it becomes difficult to identify which communities require these services, further contributing to the unequal distribution of resources and benefits.

START-UP PHASE: LOCAL CONTEXT ASSESSMENT - LOCAL RESOLUTIONS

To effectively address local social issues while developing low-carbon energy solutions, involving community members who deeply understand the social dilemma in decision-making roles is crucial. Unfortunately, many barriers prevent community participation in governance structures. To address this issue, a Local Enabling Vehicle can package best practices and deploy them in communities that lack access to such structures.

Demonstrating the effectiveness of community projects that prioritize the triple bottom line, including structures with a social lens applied to governance, can influence larger private organizations in the energy field. However, resources are often more limited in community-centric energy projects compared to larger utility structures. Thus, removing red tape for these smaller community energy projects should be explored to scale community-benefiting practices.

To foster inclusive participation within a governance structure, incentives can be provided to offset time commitments, such as stipends to stimulate interest from individuals with lived experiences of energy poverty. We can better understand the issues and develop more effective solutions by including individuals with diverse backgrounds and perspectives. Local champions who spearhead community projects also require assistance as their teams are usually small at the startup phase. A Local Enabling Vehicle connected to regional social services can play a vital role in identifying governance formation, identifying champions, facilitating capacity building, sourcing funding and opportunities, and removing red tape.

Networking is crucial for project success, but networking opportunities (such as workshops and conferences) are often handed to communities and projects with a history of success and the capacity to attend, perpetuating the issue and limiting opportunities for communities most in need of a socioeconomic spark. Embedding network-lacking communities with Industry experts can help guide their community projects, reducing the need for expensive financial, technical, and legal due diligence efforts. A one-stop-shop that links communities to appropriate stakeholders, fills community gaps, and understands the evolving landscape is essential. Such an entity

the evolving landscape is essential. Such an entity would also reduce "learning-redundancy" (communities re-learning things already learned by others). "Community projects should also be guided by industry experts to reduce the need for expensive policy and legal, due diligence efforts." Aaron Long, AREA.

START-UP PHASE: LOCAL CONTEXT ASSESSMENT - CENTRAL RESOLUTIONS

In this phase, it is critical to enhance local entities to tackle social dilemmas and incorporate low-carbon energy developments. However, many barriers prevent community participation in governance structures. This is where a Central Enabling Vehicle can play a vital role by removing these barriers and securing funding for Local Vehicles and their supported organizations. By acting as a trusted intermediary, connected to the Federal government, a Central Enabling Vehicle would lower risk and increase funding and financing opportunities. It would also work with social equity and inclusion experts to incorporate a social lens framework into governance structures and shift funding opportunities to projects focusing on a triple bottom line, effectively narrowing the equity gap.

The Central Vehicle would serve as a one-stop-shop for communities to access essential resources and expertise, streamlining the process, creating efficiencies, and shifting capacity by addressing "learning redundancy." By working with Local Vehicles, the Central Enabling Vehicle can enhance community participation in governance structures, resulting in more effective decision-making and solutions. Furthermore, the Central Vehicle can leverage its position to showcase the effectiveness of community projects prioritizing the triple bottom line, thereby influencing larger private organizations in the energy field to adopt similar practices.

To achieve social equity and inclusion, the Central Enabling Vehicle can partner with organizations and experts in these areas to ensure that governance structures and funding opportunities prioritize projects that benefit marginalized communities. By incorporating a social lens framework, the Central Vehicle can also support the development of governance structures that involve community members with diverse backgrounds and perspectives. This would provide a deeper understanding of the issues at hand and lead to the development of more effective solutions.

START-UP PHASE: LOCAL CONTEXT ASSESSMENT - CONNECTED ORGANIZATIONAL ACTORS AND FINANCING MECHANISMS

MUNICIPALITIES

Municipalities can be crucial in leading local context assessments, given their connections with nonprofits serving historically underrepresented groups. A 2019 poll suggests that Canadians trust Municipal governments the most to deliver a better quality of life, and 86% of respondents supported giving Municipal governments greater control over local infrastructure projects.[56] However, it is essential to note that the poll did not consider the perspectives of Indigenous communities, nor did it account for the influence of colonial structures on the results. Moreover, we need to verify if those who have directly experienced inequity were adequately included in the process.

Considering the potential implications of borrowing limitations and debt security offerings through local governments is also essential. They can experience significant debt service ratio implications that may affect other community services. Municipalities' limitations to project ownership, lack of in-house technical expertise, and political volatility must be

[56] https://fcm.ca/en/news-media/news-release/new-poll-canadians-trust-municipal-governments-most-deliver-better-quality

considered when assigning their role in this phase.

Therefore, while Municipalities have the potential to be influential leaders in community development, it is crucial to approach community engagement and decision-making processes with a critical and inclusive lens, ensuring that all voices and perspectives are heard and considered. This can involve targeted outreach to Indigenous communities and those with lived experiences of inequity and incorporating social equity and inclusion experts into governance structures.

COORDINATED ACCESS SYSTEM

A coordinated access system is a collaborative network of organizations that aim to simplify access to housing and support services for individuals experiencing or at risk of homelessness. By working together, these organizations ensure that clients receive the appropriate assistance at the right time while avoiding duplicative efforts and maximizing service provision through a "no wrong door" approach.[57]

It is important to note that housing security and efficiency programs are often interlinked with broader social issues when developing low-carbon projects. Therefore, community project leaders should collaborate with coordinated access system stakeholders to better understand the community's needs and ensure that their projects do not negatively impact existing support services.

SOCIAL AND ENERGY NETWORKS

As housing and social services are linked to efficiency and energy programs, the complexity of partnerships increases. Effective and efficient information-sharing networks are needed to connect energy service organizations such as utilities and trades with those essential to address housing insecurity, such as government, health authorities, land trusts, and healthcare staff.[58]

INTER-MUNICIPAL ENTITIES

Inter-Municipal entities are ideal for deploying low-carbon energy projects for several reasons. They can pressure policy and program makers to create viable revenue models and advocate for removing barriers and building opportunities. These entities can also aggregate projects and create economies of scale while remaining community-owned, serving the community's interests and avoiding Municipal barriers while leveraging Municipal relationships.

BREAKING MONOPOLIES: HOW AREA'S UNIQUE GOVERNANCE STRUCTURE BENEFITS COMMUNITIES

AREA is an inter-Municipal entity that operates in Nova Scotia, Canada, and provides a unique governance model for community-owned and controlled utilities. The organization was formed as a Section 60 corporation, which enables it to work around certain limitations and operate as a non-profit entity that benefits the communities it serves.

AREA's model has several advantages over traditional utility ownership and management. By aggregating community support, AREA can leverage the power of multiple communities, allowing them to be more effective than a single Municipality and more community-centric than for-profit utility companies. AREA also offers innovative and effective electrification-related programs to help expedite the low-carbon energy transition in Nova Scotia.

AREA provides a tangible benefit over traditional monopoly utility ownership structures by granting communities greater autonomy over their energy systems. This increased control leads to significant local economic development, job opportunities, and positive environmental impacts. Additionally, AREA is dedicated to promoting accountability from the larger for-profit Provincial Utility, NS Power, without adopting an adversarial stance.

[57] https://granicus.com/blog/no-wrong-door/
[58] https://ssac-ma.org/wp-content/uploads/2017/06/Housing-Our-Communities-Full-Report.pdf

Their emphasis on prioritizing social return and community benefit showcases how innovative governance, financing, and collaboration between communities, governments, and industry can be effective even if it operates in the shadow of a much larger utility.

START-UP PHASE: PLANNING

Planning is a critical process involving several key components, including partnership development and contract management, to create investment-ready projects. Partnership development involves identifying and establishing relationships with key stakeholders who can contribute to the project's success. Contract management involves negotiating, drafting, sourcing, securing, and managing contracts with vendors, developers, and other partners. These components are essential to ensuring a project is planned effectively and successfully executed. They help establish clear communication channels and perform due diligence through studies and engagement to ensure all parties are aligned toward achieving the project's goals.

START-UP PHASE: PLANNING BARRIER THEMES - NETWORKING INADEQUACIES, GOVERNANCE AND RISK

Accessing relevant networks to find dependable and aligned partners can be challenging. A well-connected governance structure can offer expertise and resource connections, but establishing it requires specialized knowledge and willing participants, leading to the initial challenge. Technology validation, outcome projections, project viability, and securing an off-taker are critical to reducing risk. However, obtaining competent and cost-effective partners to execute due diligence is time-consuming and expensive. These challenges are compounded by the absence of targeted information-sharing opportunities to address specific gaps.

> "DE-RISKING A PROJECT AND VALIDATING AN OFF-TAKER ARE TIME-CONSUMING ACTIVITIES THAT AREN'T STREAMLINED TO THE EXTENT THEY SHOULD BE."

Chris Henderson, Founding Executive Director, Indigenous Clean Energy

START-UP PHASE: PLANNING BARRIER THEMES - PRIORITIZING SOCIAL RETURN AND PROGRAMMATIC CHALLENGES

When planning a project, it is crucial to incorporate JEDI principles and to avoid using them as a marketing ploy to secure investments without any intention of genuinely scaling JEDI applications. This practice, known as social washing, perpetuates inequities and injustices by using token JEDI frameworks in project execution.

A structured approach is needed to ensure that JEDI principles are met, and social returns are built into program outputs. However, this is a complex challenge, given the nature of societal institutions.

One of the main challenges in program planning is ensuring that a project is investment-ready. This requires a shared understanding of the requirements and expectations of all stakeholders, including goal seekers, underrepresented individuals, investors, designers, end-users, and more. There is a gap in understanding, which leads to a lack of role assignments and faulty project design.

Assigning roles and reviewing design are crucial at all planning stages to ensure stakeholders are identified, and roles, activities, and milestones align throughout the project. However, a platform that uses intersectional language to enhance stakeholder understanding is currently lacking.

Another challenge is the allocation of funding and its connection to deliverables. While Municipalities have traditionally been the primary recipients of community project funding, private sectors such as for-profit, non-profits, co-ops, and social enterprises may be better positioned to achieve JEDI-incorporated, investment-ready projects that suit recipients' needs. Therefore, it is essential to re-evaluate the allocation of funding and its connection to objectives and milestone reporting

to ensure that funding aligns with JEDI principles and investment-ready projects.

POWERING COLLABORATION: MÉTIS NATION AND TOWN OF SMOKY LAKE TEAM UP FOR SOLAR PROJECT

The Métis Crossing Solar Project, located in Smoky Lake, Alberta, is a successful example of Indigenous-settler collaboration in renewable energy. The Métis Nation of Alberta developed the project in partnership with the Town of Smoky Lake and completed the installation in 2018.

One of the key barriers faced by the project was the lack of access to traditional financing sources, a common challenge for community energy projects of this scale. The project overcame this obstacle through alternative funding mechanisms, including support from the Municipal Climate Change Action Centre and the Alberta Indigenous Solar Program, which helped cover upfront costs. The Métis Nation of Alberta also supported development throughout the latter project phases.

The project has brought significant benefits to the community, including a reduction in greenhouse gas emissions, the creation of local employment opportunities, and access to a renewable energy source. The project also prioritized social returns through community engagement activities, including renewable energy education and awareness. The project has helped showcase the potential for Indigenous-settler collaboration in renewable energy projects and has received recognition for its successes.

The Métis Crossing Solar Project serves as an excellent example of how innovative financing solutions and collaboration between Indigenous communities, settlers, and governments can help overcome barriers and achieve success in the renewable energy sector. By providing support and funding for Indigenous-led projects that prioritize social returns, governments can help empower Indigenous communities and drive a more equitable transition to low-carbon energy.

START-UP PHASE: PLANNING LOCAL RESOLUTIONS

To overcome project planning barriers, community or jurisdictional entities can create a one-stop-shop that facilitates efficient tendering and encourages reputable partners, with JEDI principles, to participate. This can reduce complexity and challenges in finding competent and cost-effective partners while promoting the inclusion of JEDI principles in project planning.

Such a one-stop shop can also offer support in navigating the landscape, allocating contracts and funding to tasks and deliverables, and acting as an information hub to assist the project owner in managing developer and energy service vehicle contracts and complexities. By being a credit-worthy body, the Enabling Vehicle can de-risk a project by conducting a validation exercise, thus providing their "stamp of approval" and promoting non-financial outcomes, increasing impact investments and decreasing interest rates.

A one-stop shop can streamline the process, reduce redundancy, and deal with project complexities such as funding and financing, return models, stakeholders, and political and socioeconomic outcomes. Legal costs can be lowered by outsourcing and managing contracts with specialists. Furthermore, establishing a one-stop shop for reputable partners with JEDI principles can help attract project end-users, increase the project's creditworthiness, de-risk project aspects, and improve the chances of securing funding and financing.

Creating a one-stop shop for JEDI-focused projects can help alleviate many of the programmatic challenges that hinder the successful implementation of such projects. By providing support and guidance throughout the process, entities can ensure that all stakeholders are involved and project outcomes align with JEDI principles. This is crucial to building

sustainable, equitable, and just communities.

START-UP PHASE: PLANNING CENTRAL RESOLUTIONS

Establishing a Central Enabling Vehicle is crucial for expediting community energy projects focusing on Justice, Equity, Diversity, and Inclusion (JEDI) principles. Its primary role is to eliminate programmatic, networking, governance, and risk barriers by creating awareness of JEDI principles on a larger scale and as a direct link to central funding and program entities such as CMHC, IC, and NRCan. The Central Entity can offer larger-scale services and platforms to benefit local initiatives and provide credit backing to de-risk projects, thereby assisting in better integrated non-financial outcomes.

Although the Central Enabling Vehicle is not directly connected to individual community projects, it provides critical support to regional entities such as the Local Enabling Vehicles, which are well-informed about project intricacies. The central entity can help them by working on larger planning initiatives to replicate successful projects across Canada and developing supporting platforms to facilitate networking between jurisdictional chapters. One such platform is Eastern Europe's SUNShINE[59] platform, which includes project efficiency and transparency through standardization. Additionally, the central entity can offer a resource list of trusted JEDI-focused partners to mobilize social benefit incorporation into projects and expedite planning by serving as a direct link to Local Enabling Vehicles. By championing community projects and supporting regional entities, a central entity can effectively remove barriers and support the growth of JEDI-focused community energy projects in Canada.

START-UP PHASE: PLANNING - CONNECTED ORGANIZATIONAL ACTORS AND FINANCING MECHANISMS

CUSTOMERS AND END-USERS

In community low-carbon energy projects, customers and end-users are important stakeholders in the financial planning phase. Their participation and engagement are critical for the project's success since their input can help optimize the project design and ensure that it meets their energy needs effectively. Additionally, their engagement can create buy-in and support for the project, which is essential for securing financing and regulatory approvals. Customers and end-users can contribute to a successful and sustainable low-carbon energy project by identifying potential barriers to adoption and devising strategies to overcome them.

DEVELOPERS

Developers are critical to the success of community low-carbon energy projects, and their involvement during the planning period is essential. They can assist in identifying and evaluating funding options, including their long-term debt agreements, negotiate contracts such as Engineering, Procurement, and Construction (EPC), and manage risks during the development phase. EPC contracts offer a turnkey solution for project owners, transferring development risks to the developer. Additionally, developers provide valuable input into project design and equipment selection, helping optimize energy production and maximize project performance and financial returns.

MUNICIPALITIES AND URBAN FRIENDSHIP CENTRES

Municipalities have strong connections to their communities and can facilitate engagement and awareness. However, their lengthy tendering processes, overly risk-averse tendencies, and occasional lack of technical expertise can delay planning activities. Municipal plans risk delays or being scrapped altogether due to a change in council or priorities. Finally, Municipal "trailblazers" need better outlets to

[59] https://open-research-europe.ec.europa.eu/articles/1-86

share successes and challenges, particularly in planning learnings such as ownership, financing, and contract management.

It is important to recognize that Municipal structures are inherently colonial and founded on settler ideologies. Therefore, listening to Friendship Centres to approach planning through an Indigenous lens may be worthwhile. These centres, incubated by the National Association of Friendship Centres,[60] serve as important vehicles for sharing traditions and offer a space for learning. Supporting them by offering time, resources, and funding would bolster the important services they provide in communities across Canada.

Together, these vehicles can play a significant role in enabling the success of energy projects through community-driven efforts and bottom-up facilitation. They can define broad community planning outcomes, such as making energy more affordable, leveraging their community through historic trust and engagement, and offering workshop facilitation exercises. "They are the boots on the ground and play a significant role in enabling the success of projects through community-driven efforts and bottom-up facilitation," explains energy expert, Alex Chapman, of Vantage Airport Group.

LOCAL ORGANIZATIONS

Local organizations, businesses, and social service providers are essential stakeholders for community planning. These organizations have established relationships and deep connections within the community, making them valuable partners in engaging and building support for the project. Non-profit social service providers, in particular, can bring a unique perspective to the planning process, identifying the energy needs and challenges faced by vulnerable populations and ensuring that the project is designed in the interest of more vulnerable populations.

CENTRAL ENERGY ORGANIZATIONS

Central organizations such as CanREA (Canadian Renewable Energy Association) and Efficiency Canada play a critical role in community low-carbon energy projects during the planning period by providing resources, expertise, and support to planning teams. These organizations can offer a one-stop shop for communities seeking information and guidance on climate change adaptation and mitigation strategies, including low-carbon energy solutions. The Federal open-access cloud toolkits being developed under the national adaptation strategy[61] can provide project planners with access to a range of resources.

[60] https://nafc.ca/?lang=en
[61] https://www.fsds-sfdd.ca/downloads/2022-2026_DRAFT_FSDS.pdf

DEVELOPMENT PHASE

During the Development Phase, financing mechanisms and organizational actors identified in the Start-Up Phase begin operations. To generalize these institutions and roles, the Developer is responsible for developing the project, while the Energy Service Vehicle (ESV) provides technical expertise and support, and execution. Funders and investors provide the necessary capital to fund the project, while Special Purpose Vehicles (SPVs) are established to manage the financing and ownership of the project. End-use customers and utilities may also play a role in providing revenue streams and executing contracts. Ultimately, this phase begins once the project is deemed "investment ready" and concludes upon a successful project rollout, such as when a solar PV project is completed and begins generating revenue.

DEVELOPMENT PHASE BARRIER THEMES - CAPACITY AND GOVERNANCE

Insufficient local capacity in communities hinders the successful execution of planned projects. This capacity includes but is not limited to trades, project managers, financing specialists, energy specialists, building specialists, social service experts, and engineers. A lack of local capacity can result in delays, financial repercussions, and other challenges. Although outsourcing to non-local companies may appear feasible, it is often expensive, complicated, and does not encourage the practice of keeping expenditures local.

Apart from insufficient local capacity, other challenges that may arise in project execution include the development of procurement processes for low-carbon energy equipment and materials, managing local stakeholders, and community engagement.

DEVELOPMENT PHASE BARRIER THEMES - RISK

A significant risk during the development stage of a low-carbon energy project is the creditworthiness of the community entity carrying out the project (i.e. the owner). Without sufficient credit, the project may halt, preventing potential partners like Energy Service Vehicles (e.g. Efficiency Capital,[62] SOFIAC), from engaging with the project. Other risks associated with project development include technical, market, regulatory, and financial risks, such as currency and interest rate risks. Alternative methods to de-risk projects are needed to improve participation in a low-carbon economy.

DEVELOPMENT PHASE BARRIER THEMES - PRIORITIZING SOCIAL RETURN, FUNDING, POLICY, AND PROGRAMMATIC CHALLENGES

Access to financing for low-carbon energy projects can be difficult, particularly for lower-income individuals and communities with poor credit scores. Multi-unit residential building owners are often not incentivized to carry out upgrades due to long-term profit considerations, which outweigh the benefits of securing more attractive upfront funding tied to rent restrictions. "Long-term profits from increased rents often outweigh the benefits of securing more attractive upfront funding and financing terms tied to rent restrictions." Kaelan Keys, Business Development Manager at EfficiencyOne.

Furthermore, prioritizing low-carbon energy opportunities for those in energy poverty may create higher project risks and increase programmatic complexities. Despite interest from community champions, lower-income homes are often overlooked in program design in favour of single homeowners who can afford upgrades out of pocket.

Investment mechanisms also tend to benefit those in privileged positions rather than people experiencing

(systemic) oppression and who have been impacted by the negative effects of colonialism. While community investment entities, such as Community Economic Development Investment Funds (CEDIFs), provide benefits such as community ownership, and returns, they may still fail to address social issues.

Large multinational developers have advantages in accessing financing and resources for project development, but their profit-driven goals may not align with community needs. Locally owned and governed projects prioritize community needs and benefits and are managed by community members, which may better align with community values and goals.

Even locally owned and governed projects may ultimately benefit those in privileged positions. Therefore, it is important to ensure investment mechanisms are designed with JEDI principles to avoid perpetuating systemic inequities.

Securing funding also introduces programmatic complexities, such as CIB, which requires projects to be a certain size, and rolling out low-carbon programs like PACE, which require substantial efforts such as technical modeling and marketing. Additionally, policy and investment structures do little to encourage deep energy retrofits, instead favouring "low-hanging fruit" efficiency upgrades with large returns, leading to a shallow energy retrofit that is ineffective in achieving carbon reduction targets.

DEVELOPMENT PHASE - LOCAL RESOLUTIONS

The design of low-carbon projects is heavily influenced by policies. Advocacy for policy changes that shift investment structures to include social returns can create more inclusive and equitable project designs. In addition, developing workforce transition workshops can maximize the benefits of a community's low-carbon economy. For example, Alberta has launched a series of workshops to support oil and gas workers who may be affected by the transition to a low-carbon economy. The workshops provide information about low-carbon energy jobs, training opportunities, and financial support for workers to upgrade their skills. The Alberta government runs the program in partnership with industry groups and unions as part of a broader effort to support the province's transition towards a more sustainable economy.[63]

To secure better financing terms and support impactful local projects, aggregating smaller projects is essential. Enabling vehicles that link project aggregation to investment aggregation can help address the lack of a social lens in investment and energy structures while promoting implementation efficiencies, such as one deep retrofit instead of three shallow ones.

To streamline the financing process for community-based projects, a specialized entity such as a Local Enabling Vehicle (LEV) can serve as a one-stop shop. An LEV can manage subsidiary organizations like Special Purpose Vehicles (SPVs) and link projects to community finance structures such as Community Bonds. The LEV can also coordinate with financing pools like CIB, CAANO, or MIIF to provide increased access to financing options.

Increasing access to financing options and reducing perceived investment risks for community-focused organizations is crucial for their participation in a low-carbon economy. A de-risking structure beyond financial credit scores, such as insurance policies or local government guarantees, can help achieve this goal.

DEVELOPMENT PHASE - CENTRAL RESOLUTIONS

A Central Enabling Vehicle (CEV) can play a critical role in promoting the integration of JEDI principles into low-carbon projects. This can be achieved by collaborating with central funding sources such as CIB, IC, NRCan, and FCM to ensure that JEDI principles are enforced in the selection criteria.The CEV can also work with Local

[63] https://www.alberta.ca/workforce-transition-supports.aspx

Enabling Vehicles (LEVs) to tailor training curriculums to the local jurisdiction and attract and bolster the local workforce to carry out projects where workforces are lacking. These skills development and capacity building solutions should include JEDI-focused curriculums.

To address traditional risk barriers and increase investor confidence, developing loan loss reserves, credit enhancements, or guarantees to support triple-bottom-line projects should be presented as solutions. Alternative methods, such as social credit, which assesses a borrower's creditworthiness based on factors beyond traditional credit scores, can also attract a wider range of investors and increase the overall success of low-carbon energy projects. However, increased traction is required for these methods to gain adoption.

Innovative financing mechanisms such as community bonds, impact investing, and community investment models should be supported to further the development of low-carbon energy projects. Legislative barriers should also be removed if they hinder the acceleration of JEDI-focused low-carbon projects.

TAPESTRY COMMUNITY CAPITAL: WEAVING SUSTAINABLE COMMUNITIES

Tapestry Community Capital is a social enterprise that supports renewable energy and other community initiatives by introducing innovative financing models such as community bonds. They aim to bring positive change to communities by facilitating access to affordable and equitable capital, connecting investors to local projects, and supporting community champions.

Their services include marketing and governance coaching and ongoing investment management services for the entire lifecycle of the projects they help inspire. In addition, they offer funding-navigation services to help community champions overcome Start-up Phase costs, assist with networking to push project development forward and act as a one-stop shop for investors, champions, and community members to connect and collaborate.

Tapestry has worked with various organizations across different jurisdictions and sectors, including supporting CEDIF investment planning for the Town of Bridgewater to reduce energy poverty in the community. They have also received funding from the Canada Mortgage and Housing Corporation (CMHC) to help scale their model and empower even more community champions. Tapestry's commitment to community empowerment and sustainability has made them a leader in the social finance space. By engaging community members and investors alike, they create a more equitable and inclusive society while supporting positive environmental and social impacts.

DEVELOPMENT PHASE - CONNECTED ORGANIZATIONAL ACTORS AND FINANCING MECHANISMS

BACKSTOPS AND LOAN LOSS RESERVES

Backstops and loan loss reserves are financing mechanisms that can help mitigate project risk and attract investors. It involves setting aside a reserve fund that can be used if a borrower defaults on a loan. A Central Enabling Vehicle (CEV) has been identified as a key actor in implementing and managing this mechanism. At the same time, the Federal government would be responsible for providing the backstop or sourcing funders. This approach can help build confidence among investors and improve lending rates.

PROPERTY ASSESSED CLEAN ENERGY FINANCING (PACE)

Establishing information-sharing workshops can help address some of the challenges and limitations of PACE, such as low uptake, deep retrofits, multi-unit residential buildings (MURBs), and deferred maintenance. Participants can build on successes through these workshops, share lessons learned, and discuss best

practices and innovative solutions to overcome barriers. Additionally, sharing resources across Provincial borders is crucial. For instance, organizations like Clean Foundation[64] and Pace Atlantic CIC[65] have gained valuable insights in Nova Scotia by offering two similar but different products, allowing them to develop various solutions to different challenges.

MUNICIPAL IMPACT INVESTMENT FUND (MIIF)

MIIF is a promising financing mechanism supporting building retrofit capacity. In its pilot phase with Barrie, ON and Victoria, BC, MIIF aims to provide a proof of concept for future deployment in other communities. If successful, Enabling Vehicles can help manage the application and reporting process on behalf of the applying community.

COMMUNITY BONDS AND GREEN BONDS

Municipal green bonds can finance Municipal low-carbon energy projects. Still, some considerations include impacts to the municipal debt service coverage ratio.

Nonprofits and cooperatives can issue community bonds to finance community projects. These entities have more structure flexibility, but offerings are still overseen by governing bodies for approval. With JEDI principles in mind, underrepresented community members can be empowered through creative governance and investment structures.

Both debt instruments provide a way to finance projects focusing on local investments and promoting local economic reinvestment. The City of Calgary and the Alberta Solar Co-op[66] have jointly issued a bond offering which could reap the benefits of both organizational structures. However, legislation needs to be changed in most provinces to allow this.

CLIMATE ACTION ACCELERATOR TO NET ZERO (CAAN0)

CAAN0 is a newly developed fund catalyzed at MaRS Discovery District to address the barriers in financing low-carbon energy projects. It acts as a revolving energy fund (REF) that helps secure private investments in project equity while blending project returns to reduce risk, thus making it attractive to investors. The fund aims to accelerate the transition to net-zero emissions by providing capital and support to early-stage low-carbon energy projects. Doing so enables the development of new technologies, creates jobs, and strengthens communities while reducing carbon emissions.

DEVELOPER (RENEWABLE ENERGY SPECIFIC)

Developers specializing in renewable energy projects often offer financing as part of the payment terms. This type of financing can be easier to secure and offers rates comparable to those of financial institutions. The financing can be supported by impact investors who come in at high-risk pre-development stages and can be paid back with lower-interest products, like long-term debt and community bonds.

ENERGY SERVICE VEHICLES (EFFICIENCY SPECIFIC)

ESVs, such as Energy Service Companies (ESCOs), SOFIAC, and Efficiency Capital, play a critical role in sourcing, stacking, and managing financing pools for deep energy retrofits in various sectors, including industrial, residential, and commercial. To effectively carry out these functions, these organizations must be well-governed and publicly trusted. To this end, they may have a social designation such as a Social Enterprise or Co-operative or may be partnered with an organization that does, as is the case with The Atmospheric Fund's[68] partnership with Efficiency Capital. ESVs transfer risk, manage contracts, and provide a turnkey solution that combines technical expertise and financial backing to support low-carbon energy projects.

[64] https://cleanfoundation.ca/?gclid=CjwKCAjwov6hBhBsEiwAvrvN6JS-DaI_7o-o9Q-b5SZjQRbsvvlV6CmVqrJZ7xeY7EszmOnneZN-4choCb7wQA-vD_BwE
[65] https://pace-atlantic.org/
[66] https://albertasolarcoop.com/invest-with-us
[67] http://www.marsdd.com
[68] https://taf.ca/

SPECIAL PURPOSE VEHICLES (SPVS)

These are legal entities established with a specific purpose, usually to separate a particular asset, subsidiary, or financial transaction from a larger agency to keep it off the agency's balance sheet. SPVs can also be used to bypass legislative barriers that might impede a project's progress. Key actors involved in creating an SPV include legal experts, financial analysts, and government officials. Creating SPVs may prove to be costly and must be done with diligence to ensure projects are "onside" with respect to legislation.

THE CANADA INFRASTRUCTURE BANK'S (CIB) BUILDING RETROFIT INITIATIVE (BRI)

The Canada Infrastructure Bank (CIB) is at the forefront of the fight against climate change by offering a variety of financing options to promote energy retrofit projects that focus on reducing carbon emissions from buildings. Through the Building Retrofits Initiative (BRI), the CIB is committed to reducing investment barriers and driving carbon savings by providing attractive financing options that encourage private investment in large-scale retrofit projects.

Recognizing that the building retrofit sector is often perceived as risky, the CIB's investment in such projects aims to spur private sector investment in this asset class. The BRI's funding is stackable, meaning energy service companies can use it alongside other funding sources. However, some communities may struggle to access the CIB fund due to insufficient project size. To address this issue, aggregators specializing in energy retrofit projects should be utilized to streamline the application process and enable these communities to tap into the CIB's resources.

MUNICIPAL FINANCING, SUCH AS THE MUNICIPAL FINANCE ASSOCIATION IN ALBERTA

Municipal financing is a key mechanism for supporting low-carbon energy projects. Organizations like the Municipal Finance Association in Alberta offer lower interest rates than traditional financial institutions. By aggregating projects, Municipalities can achieve greater economies of scale and cost savings. However, it is important to note that Municipal financing may not be stackable. Additionally, individual Municipalities may be limited in their ability to access financing due to debt service ratio limitations.

OPERATIONS PHASE

The Operation Phase of low-carbon energy projects involves the operations and maintenance of renewable energy projects and post-installation monitoring for retrofit projects. This phase generates returns to pay back project costs and should be fully understood and integrated into the precursor Start-Up and Development phases. Revenue models for renewable energy projects can include power purchase agreements, feed-in tariffs models and net metering. In contrast, retrofit projects can use energy savings contracts such as energy leases, energy savings, and energy-as-a-service payback mechanisms.

OPERATIONS PHASE BARRIER THEMES - POLICY, PROGRAMMATIC CHALLENGES, AND PRIORITIZING SOCIAL RETURNS

Establishing financing for low-carbon energy projects hinges on having a revenue model free from risk and supported by sustainable cash flow. However, the absence of adequate funding programs and insufficient compensation for the electricity generated render most projects unfeasible in many jurisdictions. Even when funding programs are implemented, merchant return structures are perceived as uncertain, adversely affecting the project's financial viability. Small and medium-sized communities face additional obstacles because of their limited engagement with grid operators and utilities, which restricts their capacity to create financially viable projects. Additionally, efficiency payback structures, which are still in the developmental stage, face more significant obstacles than renewable energy models because of the limited demonstration of their practical application, particularly in the residential sector. Scaling operations for efficiency programs can be arduous, especially when acquiring clients and educating communities.

One key challenge for community energy projects is that profits often go to investors and institutions not necessarily invested in addressing social equity gaps or reinvesting in the community. This exacerbates issues such as renovictions and rental affordability that plague efficiency projects for multi-unit residential buildings. A broader paradigm shift is needed to address these inequities, as the current system benefits those already financially secure. However, such a shift is difficult to achieve because it requires changing deeply ingrained power structures and incentivizing actors to prioritize social returns over financial returns.

The longevity of owners and operators of community energy projects are additional critical factors. If community energy projects are to deliver long-term benefits, they must be committed to ongoing operation and maintenance. Private sector partners may prioritize short-term profits over long-term community benefits, leading to a lack of investment in maintaining and operating the project. Similarly, Municipal governments and councils may begin to prioritize other issues over the maintenance and sustainability of community energy projects, and volunteers supporting community projects may move on. This can create uncertainty for community members who have invested time and resources into these projects, leading to a lack of trust in the project's long-term viability.

OPERATIONS PHASE - LOCAL RESOLUTIONS

Local co-operatives and Community Choice Aggregation (CCA) models have emerged as potential solutions to address community energy projects' challenges. Co-op ownership tends to be more sustainable due to their strong ties to the community, creating a sense of ownership and commitment among members. As co-ops are owned and operated by community members with a vested interest in the organization's success, they are more likely to prioritize the community's long-term interests over short-term profits. In contrast, for-profit companies may prioritize profits over community interests. In California, CCAs have successfully aggregated electric loads and reinvested profits into the community, demonstrating

the potential of community-owned models to address energy equity and prove their viability.

In Ontario, several successful co-ops, such as the Ontario Sustainable Energy Association[69] and SolarShare Co-op,[70] have operated for decades. However, the lack of government support hinders the establishment of CCAs and renewable energy co-ops. Local Enabling Vehicles must advocate for policies that address regional barriers, such as introducing power purchase agreements, revising existing Provincial programs, offering rebates for JEDI-focused community projects, and incentivizing community-based ownership models. These policies will create a supportive environment for co-ops and CCAs to thrive, empowering communities to take ownership of their energy future.

The energy sector is constantly evolving, and with multiple stakeholders involved, misinformation is often spread for personal gain, resulting in a chaotic "wild west" scenario. Communities are frequently misled or given contradictory information, leading to confusion and hindering progress. Unfortunately, many communities also spend significant resources trying to make Provincial programs work, only to find out they are not financially viable and cannot incorporate social aspects beyond emission mitigation. For example, the Renewable to Retail[71] program was released in Nova Scotia but has yet to produce results despite coordinated planning efforts from multiple proponents. "It almost seems like the program was released with the attitude of 'figure it out on your own' or with ulterior motives." To combat this issue, a Local Enabling Entity can serve as a reliable and well-informed resource, connecting the dots and developing low-carbon energy revenue models without wasting resources navigating programs or identifying reputable organizations.

OPERATIONS PHASE - CENTRAL RESOLUTIONS

"For efficiency programs to become widely adopted, a market transformation is required to move them along the adoption curve, from the initial innovators to the early adopters and eventually to the early majority." Efficiency Capital's Matt Zipchen. This process involves creating awareness, building momentum, and establishing a supportive environment that encourages program uptake. To achieve this, education is key. Innovative financing tools like Efficiency Capital and SOFIAC may seem too good to be true to building owners and communities. Therefore, when scaling models, client acquisition should be supported by education and proof of concept.

To create better synergies across all stakeholders in the energy sector, a coordinated effort is needed to bridge the gap between Federal and Provincial entities, utility companies, grid managers and governing boards. A central entity, such as a Central Enabling Vehicle, could facilitate communication and collaboration between these stakeholders, establish common goals, and streamline policies and programs that encourage JEDI principles.

One proposed solution to improve synergies is establishing a standardized framework for energy efficiency programs that all stakeholders can agree on. This would create a consistent and reliable approach to energy efficiency and make it easier for building owners and communities to adopt innovative financing tools.

To promote policy that supports "Operations Phase - Local Resolutions," a Central Enabling Vehicle (CEV) must advocate for policy reforms at the Federal level. This involves engaging with policymakers and stakeholders to raise awareness of the benefits of local resolutions and secure support for their implementation. The CEV could facilitate the coordination of a regional or local Enabling Vehicle, which could gather information from Municipalities and communities, and keep the central entity informed about regional activities. By bringing together stakeholders from the energy sector, the CEV could establish a unified voice for policy change and create a roadmap for achieving the necessary regulatory changes to enable the growth of community-owned vehicles such as co-ops and CCAs.

[69] https://ontario-sea.org/
[70] https://solarbonds.ca/
[71] https://nsuarb.novascotia.ca/mandates/electricity/information-renewable-retailers-and-customers

This could involve lobbying for funding and incentives for community-owned energy projects or advocating for changes to existing regulations to make it easier for communities to access municipal utility structures, PPAs, and other financing mechanisms with a firm focus on JEDI principles.

OPERATIONS PHASE - CONNECTED ORGANIZATIONAL ACTORS AND FINANCING MECHANISMS

UTILITY, GRID MANAGERS, GOVERNING BOARDS

Utility companies, grid managers, and governing boards are responsible for managing the distribution of electricity generated by renewable energy projects. While there is no Federal governing board in Canada, many Provinces have their own governing boards, such as the Utility and Review Board[72] (UaRB) in Nova Scotia, which oversees the regulatory framework for renewable energy. Incorporating JEDI standards and practices into these entities would greatly increase the likelihood of attracting community-centred funding from investors.

PROVINCIAL AND FEDERAL GOVERNMENT

These entities play a key role in promoting renewable energy development by establishing policies and providing incentives for renewable energy projects. They would also be responsible for regulating the energy sector, ensuring that renewable energy projects comply with relevant regulations and standards, and assisting with embedding JEDI principles into new programs.

EFFICIENCY CANADA

Efficiency Canada is a trustworthy source for information on energy efficiency technologies and programs and policy recommendations that remove barriers for low-carbon projects. Therefore, considering Efficiency Canada's expertise and experience, it is advisable to consult them for reliable information and recommendations.

OPERATIONS AND MAINTENANCE (O&M) RELATED ORGANIZATION

This entity would focus on the operation and maintenance of renewable energy and efficiency infrastructure. This would include managing day-to-day operations, conducting routine maintenance and repairs, ensuring compliance with relevant regulations and standards and troubleshooting underperformance. The entity may also manage contracts with suppliers, monitor energy production and efficiency measures, and provide technical support to project owners.

CANADIAN RENEWABLE ENERGY ASSOCIATION (CANREA)

CanREA is a national industry association representing over 250 companies in Canada's renewable energy sector. CanREA promotes renewable energy's sustainable and reliable growth in Canada while advocating for policies that support the industry. The organization also provides resources and support to its members, including networking opportunities, research and analysis, and policy and regulatory expertise. CanREA's members represent various renewable energy technologies, including wind, solar, hydro, geothermal, and bioenergy. It is advisable to consult them for reliable information and recommendations on these topics.

RENEWABLE ENERGY CO-OP FEDERATION

Currently in the early stages of discussion, a national coalition of renewable energy cooperatives aims to build upon the achievements of the Federation of Community Power Co-operatives (FCPC) to increase the accessibility of community-owned renewable energy projects throughout Canada. The FCPC was crucial in developing and promoting Ontario's FIT program, which incentivized community-owned renewable energy development. However, despite their accomplishments, valuable organizations like this often lack funding, and this must be rectified.

[72] https://nsuarb.novascotia.ca/

VEHICLE TO FACILITATE RETURNS

This organization would serve as a platform for investors to contribute to renewable energy projects while receiving a financial return on their investment. The structure of this entity could take the form of an investment trust or fund. It would be responsible for aggregating capital from investors and investing it across various renewable energy projects. The organization would oversee the management of these investments, closely monitor the portfolio's performance, and disburse returns to investors. This approach would enable individuals and institutions to support renewable energy projects while generating reliable financial returns. Organizations such as Tapestry Community Capital,[73] VanCity Community Investment Bank,[74] and the MaRS incubated SVX[75] are focused on the triple bottom line and provide investment management services of this nature.

POWERING INDIGENOUS COMMUNITIES: THE RESILIENT AND EQUITABLE APPROACH OF FIRST NATIONS POWER AUTHORITY

First Nations Power Authority (FNPA) is an Indigenous-owned organization based in Saskatchewan with operations across Canada. FNPA is paramount in connecting Indigenous communities with the resources, information, and support needed to participate in community energy projects.

One of the FNPA's main objectives is to retool the relationship between Crown corporations and Indigenous peoples. They advocate for including Indigenous views in planning and stewardship while helping to identify local interests and synergies in project developments.

FNPA is leveraging local capacity and energy regulations to their fullest extent, pushing the boundaries of what is possible. They aim to move energy regulation responsibilities from the Provincial level to Indigenous communities. The organization's expertise in navigating community energy projects and building capacity among Indigenous communities throughout all lifecycle phases of a project makes them unique and outstanding.
FNPA played a significant role in developing the new Indigenous Procurement Standard, which advocates for Justice, Equity, Diversity, and Inclusion (JEDI) principles in procurement processes. The standard earmarks a portion of funds for Indigenous trust funds and Indigenous capacity funds used to strengthen local communities.

FNPA has successfully implemented community energy projects that draw upon Indigenous resilience despite facing resource-intensive challenges. Their community-owned approach embodies Indigenous resilience and prioritizes local economic development while remaining attuned to emerging opportunities in the energy sector. As such, FNPA serves as an inspiring model for the future of sustainable energy.

[73] https://tapestrycapital.ca/
[74] https://vancitycommunityinvestmentbank.ca/
[75] https://svx.ca/

CONCLUSION

BREAKING THE CHAINS OF COLONIALISM: CENTERING INDIGENOUS KNOWLEDGE IN CLEAN ENERGY

As a result of discussions with Indigenous individuals, it has become apparent that while the low-carbon energy transition is essential, it cannot take precedence over the more significant need to remove the oppressive barriers that have long harmed Indigenous communities. This study has provided a glimpse into the remarkable knowledge, stewardship, and connection to the land that Indigenous communities hold regarding the environment and natural resources. However, there is still much to learn and understand. It is essential to recognize that Indigenous peoples have been the original stewards of this land for thousands of years, and their knowledge and practices should be respected and valued. Therefore, Indigenous communities must be given a leadership role in the low-carbon energy transition, with allies listening and offering support and resources as needed while recognizing that the larger goal is to remove the systemic barriers that have long been in place.

It is important to note that this study has not fully explored other systemic barriers to poverty and racial inequality. These issues must be addressed simultaneously, as they are interconnected and require a paradigm shift towards a more just and equitable society. Nor does this study provide all-encompassing views from all Indigenous perspectives–instead, we listened to the voices and lived experiences of a select few individuals and used their insights to guide our research.

> “AS A MI'KMAQ PERSON, I CANNOT OVEREMPHASIZE THE URGENT NEED TO DISMANTLE THE COLONIAL STRUCTURES THAT HAVE LONG OPPRESSED AND MARGINALIZED OUR COMMUNITIES. SETTLER COMMUNITIES MUST TAKE RESPONSIBILITY FOR THE HARM THEY HAVE CAUSED AND COMMIT TO MEANINGFUL ACTION TOWARD RECONCILIATION. HOWEVER, THIS MUST GO BEYOND TOKENISM AND POLITICAL LEVERAGE. IT REQUIRES WELL-INTENDED LISTENING TO SUPPORT INDIGENOUS COMMUNITIES WHILE REMOVING THE SYSTEMIC BARRIERS THAT PREVENT THEM FROM THRIVING. IT IS CRUCIAL THAT ALLIES RECOGNIZE THE MANY WAYS TO SUPPORT INDIGENOUS SOVEREIGNTY AND DECOLONIZATION AND THAT THEY ENGAGE IN THE HARD WORK OF CREATING LASTING, SYSTEMIC CHANGE THAT BENEFITS ALL. WE NEED ALLIES TO AMPLIFY OUR VOICES, BUT NOT AT THE EXPENSE OF FURTHERING OPPRESSION OR BUILDING THEIR NARRATIVES ON OUR BACKS.”

Violet Paul

IDENTIFIED BARRIERS TO ACHIEVING AN EQUITABLE LOW-CARBON ENERGY TRANSITION

Our study emphasizes the vital role of Indigenous perspectives in project implementation, which addresses historic injustices towards Indigenous peoples and underpins sustainable development. We also acknowledge the importance of Justice, Equity, Diversity and Inclusion (JEDI) principles and have attempted to incorporate them into solutions while identifying deficiencies that need to be addressed in current institutions. We firmly believe that JEDI and Indigenous values are closely connected. While the following section highlights low-carbon capitalization themes, it is just one aspect of the broader conversation on Indigenous engagement and sustainable development.

In conclusion, the report identifies eight barrier themes that hinder low-carbon project development across all project phases:

1. **Funding**
2. **Policy**
3. **Networking Inadequacies**
4. **Prioritizing Social Returns**
5. **Programmatic Challenges**
6. **Capacity**
7. **Governance and Risk**

IDENTIFYING SOLUTIONS: RESOLUTIONS

Based on our research and interviews with stakeholders, we found that while some proposed solutions differed, many characteristics overlapped. One key finding was that significant funding is available to support low-carbon energy initiatives; the challenge is getting projects investment-ready. To address this challenge, there needs to be a catalyst that mobilizes the existing organizations, ideas, and resources and takes advantage of the available funding. Enabling Vehicles, sometimes referred to as "hubs," were seen as a solution.

ENABLING VEHICLES: RESOLUTION CONCLUSIONS

ENABLING VEHICLES

Local Enabling Vehicles (LEV) and Central Enabling Vehicles (CEV) are needed to resolve barriers by providing more specialized and efficient community support. LEVs have a well-connected interface with jurisdictional stakeholders, while CEVs coordinate efforts across multiple LEVs, provide support, and focus on universal resolutions. By separating the two, we can avoid adding unnecessary layers of bureaucracy and ensure more efficient and specialized support for the community. CEV and LEV functions, and how to foster their creation, are summarized below.

LOCAL ENABLING VEHICLES (LEV)

The LEV acts as regional chapters of the CEV that serve as a one-stop-shop to facilitate the community's participation in the low-carbon economy by providing local expertise, removing barriers, and helping establish community investment-ready products while fostering community champions. This vehicle is a jurisdictional subject expert that acts as the link between the community, CEV, and networks to fill gaps that communities face. They may assist in aggregating funding opportunities and projects, engaging subject experts to expedite project delivery, developing community partnerships, assessing resources, and driving change in deficient sectors while promoting JEDI practices throughout all sectors. LEVs also engage local contractors and suppliers, influence policy barriers to simplify and achieve better outcomes, and act as a dot connector and resource with the expertise to identify and appropriately fill community gaps. LEVs provide a structured platform for sharing learnings and barriers with other communities.

CENTRAL ENABLING VEHICLE (CEV)

CEVs are crucial in connecting LEVs' learnings and driving the execution of broader strategic plans. CEVs play a key role in supporting LEVs through knowledge-sharing, unlocking resources, and providing best practices while advocating for policy changes and building relationships with external stakeholders. The ultimate goal of CEVs is to achieve effective outcomes for the community by offering technical assistance, capacity building, training, support, monitoring progress, and enforcing a JEDI-focused project development approach.

To achieve their objectives, CEVs take several central resolutions, including removing barriers to catalyze JEDI projects while adding sanctions to structures that widen JEDI gaps. Additionally, they establish de-risking mechanisms, resolve central programmatic deficiencies, establish clear guidelines and standards, provide access to specialized experts and incubate programs that develop community workforces and mobilize market transformation, and create a central hub for sharing resources. Working closely with LEVs and other stakeholders, CEVs are committed to removing barriers to participation and driving more effective outcomes for communities and their projects.

DEVELOPING THE CEV AND LEVS

Dozens of existing enabling vehicles were studied, and below is just a fraction of what's out there. Some are more central (i.e. CanREA), others local (i.e. Low Carbon Cities Canada[76] accelerators), while others lie somewhere in between (Efficiency Nova Scotia[77]). And while some specialize in a particular service like efficiency navigation for small businesses (Navigate Energy[78]), some provide broader support (Clean Air Partnership[79]).

We can not conclude that these existing entities can be bolstered to fill the CEV and LEV roles but do conclude that supporting and synergizing existing hubs, and the communities they serve, through centralized said vehicles would better enable low-carbon projects.

The next steps for implementing the Local and Central Resolutions should focus on developing a detailed action plan and the timeline for the roll-out of the resolutions. This plan should outline specific activities, timelines, and milestones for each phase of the implementation process and should be developed in collaboration with Indigenous communities and stakeholders. Additionally, the plan should include a comprehensive monitoring and evaluation framework to ensure that progress is tracked, challenges are identified, and adjustments are made to achieve the goals of the local and central resolutions. In no particular order, we conclude that the following activities would support LEV and CEV development but recommend an agile approach to methodology to pivot as needed.

- Planning and engagement: Engage with Indigenous communities and stakeholders to plan the implementation of the resolutions through consultation, collaboration, and co-design to ensure that perspectives, needs, and priorities are incorporated.
- Scan of all existing LEVs and CEVs (hubs): Scan all existing hubs, networks, communities and organizations to identify gaps, overlaps, and opportunities for collaboration, partnership, and support to align the resolutions with existing initiatives.
- Determine roles: Establish clear roles and responsibilities for all stakeholders involved in the implementation of the resolutions, including planning, engagement, capacity building, knowledge sharing, funding, and monitoring and evaluation.
- Develop capacity-building programs: Design capacity-building programs to meet the specific needs of communities and organizations, focusing on building skills, knowledge, and networks to enable them to participate fully in the energy sector.
- Establish knowledge-sharing mechanisms: Create structures for disseminating knowledge to facilitate the exchange of information and ideas between communities, industry leaders, and policymakers.

RECOMMENDATIONS

1. Be an ally to Indigenous peoples and efforts: This means acknowledging the harms caused by colonization and supporting their leadership and direction. It also means engaging in respectful and meaningful consultation with Indigenous communities, listening to guidance and recommendations, and incorporating traditional ecological knowledge into decision-making processes. Supporting Indigenous-led energy organizations and incorporating the Mi'gmawe'l Tplu'taqnn Inc. (MTI) model should be prioritized to help promote Indigenous self-governance and revitalize traditional knowledge. Additionally, addressing potential impacts on Indigenous women and girls, exploring the role of renewable energy technologies in Indigenous communities, and incorporating the rights of Indigenous peoples under the UNDRIP into energy development practices to help mitigate colonial power dynamics and promote sustainable and equitable energy development is essential.

[76] https://lc3.ca/
[77] https://www.efficiencyns.ca/
[78] https://www.navigateenergy.ca/
[79] https://www.cleanairpartnership.org/

2. Institutionalize the "No One Left Behind[80]" principle into all policies and practices. This means incorporating the values and principles of justice, equity, diversity, and inclusion into the formal structures and processes of the government so that they become an integral part of its culture and decision-making. The government should also action "Nothing About Us Without Us[81]" which emphasizes the importance of involving all stakeholders, including marginalized and vulnerable groups, in decision-making processes that affect them and mobilize the core principles to influence all sectors. By adopting these principles, the government can ensure that its policies and practices promote all its citizens' well-being and dignity, leaving no one behind.
3. Building off this study and addressing communities' low-carbon capitalization barriers, central and local enabling vehicles should be incubated. Providing financial and technical support for planning, developing, deploying and expanding new and existing enabling vehicles is essential to mobilize low-carbon energy projects.

[80] https://unsdg.un.org/2030-agenda/universal-values/leave-no-one-behind
[81] https://www.canada.ca/en/government/publicservice/wellness-inclusion-diversity-public-service/diversity-inclusion-public-service/accessibility-public-service/accessibility-strategy-public-service-toc/progress-report-implementation-nothing-without-us-2019-20.html

APPENDIX A: LITERATURE REVIEW

AGGREGATING LOW CARBON ENERGY PROJECTS FOR INVESTMENT

REPORT 1: LITERATURE REVIEW
SEPTEMBER 2022

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INTRODUCTION

BACKGROUND

Canadian communities are increasingly developing low-carbon, local energy projects, but they face road-blocks when it comes to financing these projects. Large Canadian investors are increasingly seeking low-carbon investments, but are challenged to find these locally and at a scale large enough for investing.

OBJECTIVE

The Aggregating Low Carbon Energy Projects for Investment (ALCEPI) project aims to address these gaps, resulting in the acceleration of low-carbon investments at the local level across Canada. This applied research project will help Canadian communities learn how to aggregate or bundle their local, low-carbon energy projects to unlock capital from large investors.

PURPOSE

QUEST staff undertook a literature review to gain an understanding of the existing research and practice relevant to the financing of local low-carbon energy projects. This Narrative Report is intended to summarize the material reviewed and present the knowledge gained through the literature review process.

OVERVIEW

The Report covers a broad range of program models that address how retrofit programs can be capitalized and projects financed; business models and financing mechanisms that can facilitate repayment of loans and investments; and enhancement strategies that can drive investment and build capacity in key sectors. It also summarizes the literature reviewed and provides definitions of key terms and concepts.

STRUCTURE

For each of the program models identified, a brief descriptive overview is provided, along with information where applicable from the literature or other sources related to:

- Opportunities presented by the program to advance the financing or implementation of local low-carbon energy projects or the associated objectives of key stakeholders;
- Barriers Addressed by the program to the financing or implementation of local low-carbon energy projects;
- Barriers Identified that the program fails to overcome or can itself be limited by
- Current Program Status within relevant jurisdictions

ABOUT QUEST CANADA

QUEST Canada is a national non-profit that supports communities in Canada on their pathway to net-zero. Since 2007, we've been facilitating connections, empowering community champions and influencing decision-makers to implement efficient and integrated energy systems that best meet community needs and maximize local opportunities. We develop tools and resources, convene stakeholders and rights holders and advise decision-makers — all with the goal of encouraging and enabling communities to contribute to Canada's net-zero goals.

CAPITALIZATION STRATEGIES

Capital must be raised in order to finance community energy initiatives. Broadly, this may be done through debt financing (e.g. issuing bonds or acquiring a loan) or by selling equity (e.g. stocks or shares).

Communities can allocate reserves and revenues to finance these projects, but such funding pools are limited and in demand. Green bonds are a spin on traditional bond offerings that are designed and administered by various organizations to finance green projects such as community energy initiatives. Beyond these traditional mechanisms, new organizations may be created and structured specifically to facilitate raising capital (as well as potentially directly use that capital to finance community energy initiatives). Examples include the creation of green banks, financial warehouses, or subsidiary corporations such as

GREEN BONDS

A green bond is a type of fixed-income instrument that is specifically earmarked to raise money for climate and environmental projects. These bonds are typically asset-linked and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations.

Municipal Green Bond

Bond markets are a source of low-cost capital for cities, municipalities, and affiliated
Entities. Municipalities can issue Green Bonds to raise debt capital for climate-friendly urban infrastructure projects (Carvalho, 2018).

- Opportunities:
  - i. Debt financing is 'politically easier' for communities than raising taxes
- Barriers identified:
  - ii. Green bonds typically have higher issuance costs than "regular" debentures, though this could decrease as the market for the bonds grows
  - iii. Smaller municipalities have limited capacity to take on debt and few "are considered creditworthy and can directly access capital markets"
  - iv. Municipalities with the capacity to take on debt may be impacted by factors beyond their control influencing credit ratings, availability, and borrowing costs.
  - v. Obligation to service debt from bond issues can impact future budgets and financial abilities, requiring municipalities to limit spending and/or increase taxes.

Environmental Impact Bond (EIB)

An EIB is used to fund environmental projects using a pay-for-success approach wherein private investors pay the upfront costs for deploying the project, and are repaid an amount based on the achievement of agreed-upon outcomes. EIB's are well suited to pilot new approaches whose performance is viewed as uncertain (Carvalho, 2018).

- Opportunities:
  - i. EIBs can be designed to meet the issuer's particular needs, such as providing risk coverage in the case of underperformance, or a benefits share with investors and contractors to incentivize exceeding performance.
  - ii. EIBs can improve project planning and transparency as proponents predict, evaluate, and disclose environmental outcomes of funded projects. Either to pilot a new approach whose performance is viewed as uncertain or to scale up a solution that has been tested in a pilot program.
  - iii. EIBs can transfer financial risks away from the public if the projects are not successful, with investors agreeing to take a lower return based on the outcome of the project.
  - iv. EIBs can align the interests of investors, local governments, and service providers behind an environmental objective.
- Barriers identified:
  - v. EIBs can have additional setup costs when compared with traditional municipal financing programs, including transaction structuring, and monitoring

and evaluation by a third party – though these would decline in the future once a legal template is in place from the first transaction.

vi. Some jurisdictions (e.g the Province of Ontario) limit the types of debt obligations muni can issue, generally to fixed-rate debentures, which may prevent them from issuing EIBs.

vii. EIBs could give investors influence on policy interventions and decisions.

viii. Limited applicability: it may be impossible or inappropriate to use a standardized, rigid metric to measure the outcomes of certain types of environmental interventions.

Retail Green Bond

CoPower, a Canadian sustainable investment platform currently owned by VanCity Investment Bank, generated Canada's first retail green bond offerings, which gave individuals with as little as $5,000 the ability to invest to support carbon-cutting projects through 6-year, 5% bonds. The bonds were backed by loans to real clean-energy and energy-efficiency projects sourced and evaluated by the company's team of project development and finance professionals (Drainie, 2018).

a. Opportunities

i. In 2018, CoPower made a $6.4m investment in a portfolio of small, residential geothermal projects owned by Geotility with capital raised through a green bond offering. The investment recapitalized Geotility, which owned and operated the projects, allowing the company to develop new projects.

ii. Barrier identified:

iii. The CoPower Green Bond model relied on the 'spread' between the interest rate charged on the clean energy project loans and the rate paid to green bond investors to cover operating costs associated with fundraising, lending, and managing the portfolio, technology, and investors. In a continuing low-rate environment, it became increasingly challenging to lend to great projects and issue private bonds at competitive rates while making those economics work.

PUBLIC LOAN PROGRAM

Public loan programs for retrofit financing generally take the form of low-cost loans provided by governments to private building owners (Brown et al., 2019).

The Canadian Loan Fund for Residential Energy Efficiency and Renewable Energy is a program model developed by ENVINT Consulting in 2008 to respond to the identified need for low-interest, long-term financing in order to enable the increased uptake of residential energy efficiency and renewable energy. It involved a Federal government loan to a specialized Fund that would, in turn, loan dedicated capital, on a competitive basis, to key industry players such as utilities, Provincial governments, municipalities and private sector vendors (intermediaries) (Tampier, 2008).

a. Opportunities:

i. ENVINT suggested that by providing a modest amount of grant funds and by issuing a new series of bonds, the government of Canada would create a viable and cost-effective entity capable of supporting renewable energy and energy efficiency at the residential level in Canada. The proceeds of these bond issues would be loaned to the Fund at an interest rate and on terms essentially the same as the government itself paid. The Fund would repay the Federal government as the intermediaries repay the Fund.

ii. Public funds raised through capital markets can provide project financing at very low interest rates.

b. Barriers Addressed:

i. If a public loan program lends to a municipality to support LIC activities, the loan would still increase the debt of the municipality and would not be useful to a municipality that has reached its debt service limits or that has policies against

increases in debt. If, on the other hand, the government were to guarantee the loan to the municipality, that loan might be accounted for differently; a government-guaranteed loan may not actually add to the municipal debt ratios. The FCM loan program stream, which requires a minimum 5% of its grant funding to be put towards a loan loss reserve fund, effectively addressed this issue.

c. Barriers Identified
   i. Public funds used to directly finance retrofit projects can offer attractive interest rates but don't attract private finance to the market.
   ii. Program Status:
   iii. The Federation of Canadian Municipality's (FCM) Community Efficiency Financing (CEF) program seems to be based on or a version of this program model, providing communities with a grant combined with a low-interest loan to implement a new community efficiency financing program or scale up an existing model. The CEF program also has a credit enhancement stream.

GREEN BANKS

Green banks are mission-driven financial institutions specialized in the provision of financing for projects with environmental benefits. They are often established to complement existing financing institutions by attracting and leveraging private capital that otherwise might be unavailable to a particular market or segment. (Green Banks, n.d.) A number of US states have a green bank or are exploring creating one, and there are numerous international examples as well. (Carvalho, 2018)

a. Opportunities:
   i. Being mission-driven means that Green banks care about deploying clean energy rather than maximizing profit. They actively develop projects and seek out opportunities in the market.
   ii. Green banks can act as financial aggregators, mediating between municipalities (or other subnational actors) and capital markets.
b. Barriers identified:
   i. Green banks use financing, not grants. Financing means that capital is eventually expected to be returned or repaid. Because of this approach, green banks focus on markets where there is potential for payback. This generally means proven, technically viable projects that are well past the research and development stage. (What is a Green Bank, 2020)
   ii. It is not clear whether Canadian municipalities can create their own financial aggregators. The City of Toronto designed the Toronto Atmospheric Fund to perform some of the functions usually attributed to green banks, and its model could be adopted by other municipalities, but expanding the role of such institutions beyond the provision of small home-energy grants or loans would require analysis of their legal and commercial limitations.
c. Program Status:
   i. There was a proposal in Ontario to create a green bank – the Ontario Climate Change Solutions Deployment Corporation – under the Ontario Development Corporations Act, but the enabling regulation was revoked by the Conservative Provincial government in 2019.

The Canada Infrastructure Bank's (CIB) Building Retrofit Initiative (BRI)

The CIB's BRI provides financing for energy retrofits projects, invests in the decarbonization of buildings, and provides attractive financing to reduce investment barriers and drive carbon savings. CIB investment in large-scale projects is intended to crowd in private capital where investment from the private sector has traditionally been limited due to the uncertain nature of expected cost savings and help establish energy retrofit

investments as a distinct asset class.
The BRI has two streams:

- The public stream includes all levels of government, Indigenous communities, schools, hospitals, and universities. This stream requires no upfront capital contribution or minimum payment guarantees from the Public sponsor, and all returns on CIB capital investment is repaid through realized energy savings – meaning the CIB and the private sector partner absorb the risk. CIB teams aim to work with the public sector to review their asset portfolios from a holistic perspective to develop bundles of energy retrofit projects
- The private stream includes privately owned commercial, industrial, and multi-unit residential buildings. This stream provides attractive financing through long loan tenors and low interest rates and shifts performance risk away from building owners. Debt pricing and terms are tied to GHG savings with minimum thresholds to drive emissions reduction.

CIB can cover up to 80% of the project/pool value, and requires a minimum amount of project funding in the form of equity (as opposed to debt). Its minimum investment is $25M, but will work with aggregators of public or private building portfolios. Eligible project portfolios must target a minimum of 30% overall emissions reduction (CIB Building Retrofits Initiative, n.d.).

a. Opportunities:
   i. Pre-development financing is available to accelerate high-potential projects. Up to 4% of the CIB's investment is available for funding retrofit project predevelopment.
   ii. CIB can finance up to 80% of the project/pool value
   iii. Variable interest rate contingent on target GHG savings encourages deeper retrofits.
b. Barriers addressed:
   i. Maximum 25-year term for full repayment allows for the financing of deep retrofits that might not otherwise be financially viable.
   ii. Long-term stable financing terms improve certainty of savings realized by retrofits.
c. Barriers identified:
   i. Minimum investment is $25M, which limits the CIB to investing in large projects, but CIB will work with aggregators of public or private building portfolios to finance projects made up of several smaller pieces that reach its minimum investment threshold.
   ii. Program Status: Launched in 2021, ongoing.

UK National Green Investment Bank (GIB)

The UK GIB is a public entity established specifically to facilitate private investment into domestic low-carbon, climate-resilient (LCR) infrastructure. (Green Investment Banks, n.d.).The GIB started operating in 2012 as a government-owned institution, with a broad mission to mobilize private capital and support green projects that, even if feasible, had trouble securing financing. The UK Enterprise and Regulatory Reform Act set out the statutory basis for the "green purposes" of the GIB, the commercial practices it followed to provide lending to projects falling into five areas prescribed, and the process by which it could become fully independent of government. The Act also set out what assistance the government was allowed to provide; the GIB was originally capitalized by the UK National Government with an initial investment of £3bn (Ares, 2015).

- Barriers identified:
   i. The GIB's enabling legislation mandated that it would not be allowed to raise its own (i.e. private) capital until at least 2015. This meant that the bank could borrow in financial markets, even though one of its stated purposes was to leverage private financing.
   ii. While the GIB was designed to focus on projects that could not find private funding, one of its main investment guidelines was to restrict investments to low-risk projects that offer good return/

risk ratios.

- Program Status:
  - iii. In 2017 the UK government sold the Green Investment Bank (GIB) to Macquarie Group Limited. The government decided that moving it into the private sector now would free it from the constraints of public sector ownership allowing it to increase investment in our green infrastructure to accelerate the transition to a green economy. Five independent trustees have the power to approve or reject any proposed changes to the bank's green purposes in the future.

New York Green Bank (NYGB)

The NYGB is a State-sponsored, specialized financial entity established in December 2013 and capitalized with a total of $1 billion in funds. Dedicated to clean-energy-market growth and innovation, the bank works with the private sector to increase investments into New York's clean energy markets. The mission of NYGB is to "[collaborate] with private-sector market participants; [implement] structures that address gaps and overcome barriers in current clean-energy financing markets; and [transform] those markets by enabling greater scale, new and expanded asset classes, and greater liquidity." (Johnson & Molta, 2017).

- Opportunities:
  - i. NYGB has conversations with private-capital providers to determine what level of financial returns would look attractive to investors in future rounds. That way, once one of its portfolios has performed for a period of time, outside investors will see that there is less risk and will step in and capitalize additional projects.
- Barriers addressed
  - ii. NYGB does not have a mandate to support a specific set of financing structures. This flexibility allows it to support a range of initiatives, operating where market participants are facing financing barriers and addressing those barriers with scalable solutions.

FINANCIAL WAREHOUSES

Financial warehouses act as conduits for the aggregation of smaller, illiquid loans, packaging the respective cash flows and re-issuing them as asset-backed securities or bonds to investors (Carvalho, 2018).

The Warehouse for Energy Efficiency Loans (WHEEL) was the first secondary market for home energy loans in the USA, aimed at financing residential energy efficiency by providing low-cost, large-scale private capital to state and local government and utility-sponsored residential energy efficiency loan programs. Developed by a consortium of Energy Programs, WHEEL purchased unsecured residential energy efficiency loans originated in participating programs. The loans were aggregated into diversified pools and used to support the issuance of rated asset-backed notes sold to capital markets investors. Proceeds from these note sales were used to recapitalize WHEEL, allowing it to continue purchasing eligible loans from state and local programs for future rounds of bond issuance (WHEEL: A Sustainable Solution for Residential Energy Efficiency, n.d.).

- Opportunities:
  - i. Designed to reduce the cost of capital over time by expanding the public performance data available for these loans, familiarizing secondary market investors with the asset class, and achieving increasing economies of scale as more and more loans are sold into the warehouse.
- Barriers addressed:
  - ii. Keystone HELP, Pennsylvania's financing program for energy-efficient home improvements, was principally supported by the Pennsylvania Treasury Department. It offered low-rate loans to help eligible homeowners make affordable energy-efficiency home improvements. Pennsylvania Treasury began Keystone HELP expecting to hold loans to term. Because of the program's success, however, the Treasury would exhaust all the funds it was prepared

SUBSIDIARY COMPANIES

A subsidiary is a company owned and/or controlled by another parent company.They may be owned by private companies, governments, or public entities. Subsidiaries are generate separate legal entities for the purpose of taxation, regulation, and liability.

Special Purpose Vehicles

Special Purpose Vehicles (SPVs) are off-balance sheet legal entities (i.e., separate corporate bodies) created to fulfill a temporary objective. SPVs can be used to attract financing while reallocating debt burden and risk to the sponsor organization, however the use of SPVs may come with potential risks around reduced transparency and reputational risk (The Next Chapter: Creating an Understanding of Special Purpose Vehicles, 2011).

a. Opportunities
   i. Assets can be securitized by being pooled and repackaged into interest-bearing securities for the sponsor organization
   ii. SPVs can attain financing without increasing the debt burden of the sponsor
   iii. Risk is reallocated in event of bankruptcy/default (though "this has been challenged recently")
   iv. Balance sheets and accounting for SPVs may be more favourable for the sponsor
   v. Credit quality for a SPV is based on capital and - particularly for non-investment grade companies - can achieve lower funding costs by isolating assets in a SPV.
b. Barriers
   i. Activities conducted through a SPV may have reduced transparency
   ii. Even in cases of being "bankruptcy remote" the sponsoring organization may have reputational risk for underperformance or default, which may pose a broader risk to the sponsor's related initiatives. These risks may pressure the sponsor to provide additional financial support to the SPV if there , which can reduce investor motivation to scrutinize oversight.

YieldCo Structure

YieldCos are partially owned subsidiaries of larger energy companies, designed to hold operational projects that were developed by the parent company – or by other developers, but usually the main source of projects is the parent company (Mitidieri, 2020).

- Opportunities
  i. Large, integrated energy companies have multiple sources of revenues, returns, and risks. A YieldCo isolates the operational and long-term contracted renewable energy assets, reducing the risk profile by separating operating assets from riskier activities such as project development, making it easier to attract risk-averse investors who are looking for more stable, predictable returns (e.g. from power purchase agreements).
  ii. Large energy companies can "sell" operational projects to a YieldCo in order to generate capital to put towards the development of new projects.
- Program status
  iii. YieldCos had a valuation bust after SunEdison's bankruptcy in 2016. SunEdison had sponsored 2 YieldCos that operated on assumptions for portfolio growth coming from the parent company; their failure had an impact on all YieldCos' abilities to attract additional equity.

COMMUNITY FINANCING

Community Financing is a pool of capital which is raised from individuals within a community to make equity investments in local projects which benefit the community. Community Financing Economic Development Investment Funds (CEDIF), developed in Nova Scotia, use a legislative mechanism to offer up to 65% in non-refundable Provincial equity tax credits to encourage local investors to provide equity financing

to local for-profit entities. CEDIFs have been structured to finance solar photovoltaic (PV) systems on residential properties, investment in community wind farms, and are being explored as potential funding sources for community energy efficiency programs (Dunsky Energy Consulting & Verterra Group Environmental Services, 2019).

- Opportunities:
  - i. Community Financing programs enable and encourage citizens to invest in their community and small local businesses. CEDIFs can provide further incentives to drive investment.
  - ii. Community Financing could facilitate equity investments in energy efficiency, which usually generates a higher cost of capital, as investors in these programs may be willing to accept lower-than-market returns in exchange for local community and environmental benefits.
- Barriers addressed:
  - iii. In 1993, Nova Scotia passed the Equity Tax Credit Act to encourage investment in local businesses through tax credits. The tax credit was initially underutilized. A working group with representatives from the Nova Scotia Securities Commission, Finance Department and Department of Economic Development and Tourism identified a range of barriers to adoption of the tax credit, "including the cumbersome documentation required of enterprises and the lack of community infrastructure to support it". Community Economic and Development Investment Funds (CEDIFs) were formally launched in 1999 to facilitate access to the available tax credits and increase the amount of local capital invested in Nova Scotia by making it easier for local entrepreneurs to get access to capital and support the development of new businesses.(Schwab Foundation for Social Entrepreneurship, 2013)
- Program status:
  - iv. CEDIFs are only enabled and operational in Nova Scotia. However, co-operative funds exist in a number of jurisdictions across the world, including Germany and the UK.

BUSINESS MODELS AND COMPENSATION AND FINANCING MECHANISMS

A strong business model for financing community energy initiatives is key to both raising capital from potential investors and ensuring long-term funding sustainability. Since many community energy initiatives make returns based on avoided energy costs as opposed to directly generating revenue, such as in the case of energy efficiency projects, a variety of repayment mechanisms may be used to realize returns on investments.

COMPENSATION MECHANISMS

Compensation mechanisms are means through which parties can receive value for investments that they make or costs that they incur.

Feed-in Tariffs (FITs)

FITs are policy tools designed to promote investment in renewable energy by setting a fixed price for electricity from renewable sources and requiring utilities to pay more than their avoided cost, i.e. an above market price, for renewable energy delivered to the grid. FIT regimes offer would-be renewable energy producers access to the grid; long-term contracts; and guaranteed, cost-based purchase prices (Tampier & Beaulieu, 2006).

- Barriers addressed
  - i. Long-term agreements and guaranteed prices shelter producers from some of the risks inherent in renewable energy production, encouraging investment and development that otherwise might not take place.
- Program status
  - ii. FITs were developed in the USA in the

1970's and are employed in jurisdictions all over the world, though they are becoming less popular.

Net Metering

Net metering regimes allow on-site renewable energy producers to feed energy into the public grid at the retail price, with participants being credited for all of the power they generate and paying the utility only for what they consume above their own production. Net metering is mostly used to support smaller, distributed energy systems installed on or near buildings (Tampier & Beaulieu, 2006).

a. Opportunities
   i. Net metering programs improve the return for the renewable energy generation project owner by valuing the electricity generated at the retail rate rather than at the utility's avoided cost.
b. Barriers identified
   i. In net metering regimes in which producers are credited for their energy at retail levels, utilities must internalize the fixed costs of building, operating, and maintaining a distribution system. While of negligible impact at small scales, this can result in the costs disproportionally being borne by non-net metering customers as adoption levels increase.

Virtual Power Purchase Agreements (PPA)

A PPA is a financial agreement between two parties: one that generates energy, and another that buys it. PPAs are a common strategy for financing renewable energy projects, with parties agreeing to purchase energy from a project that hasn't been built yet at a specific price and for a specified period of time. These kinds of virtual PPAs do not involve physical delivery of energy: rather, the energy produced is fed into the power grid and purchased from a 3rd party delivery agent. In certain regimes, purchasers can also receive Renewable Energy Credits (RECs) from the project, which represent the renewable attributes of the energy generated and fed into the grid (Palmer & Cleary, 2019).

- Opportunities:
  i. For the purchaser, a PPA can serve as a hedge arrangement against price volatility that offers cost predictability for electricity use.
  ii. For energy generation project developers, PPAs are long term contracts representing predictable revenues, which help attract project financing and investment.
  iii. PPAs can allow customers to engage directly with specific projects that may be particularly attractive to them.
- Barriers addressed:
  iv. PPAs allow energy users without the ability to make a large upfront capital investment, or install their own renewable energy generation system, to support renewable energy.
- Barriers identified:
  v. A PPA can require a long-term contract, reducing financial flexibility.
  vi. The financial arrangement can be complex and expensive to create.
  vii. Access to PPAs can be limited, depending on the regime, to certain types or scales of customer/energy users.

BUSINESS MODELS

A company's business model explains how it works: how it creates or delivers value through products or services; who or what its market is; and how it generates revenue, recoups expenses, and makes a profit.

Community ESCO

The Town of Bridgewater's Community ESCO model is a residential energy retrofit program designed to encourage ESCOs to implement retrofits in residential buildings, and to reduce the barriers faced by homeowners. This model involves an ESCO managing the complete process of upgrading the energy efficiency of participants' homes, from initial recruitment to final closure of the project. Energy efficiency measures would be implemented at no costs for the participant and the monthly energy bill savings

would be used to reimburse the ESCO for the retrofit work.

The Community ESCO model relies on a program administrator that would, among other things, approve each project and retrofit contracts between the participant and the ESCO and manage the financing and payment processes. They would also conduct quality control activities and track the results of the program and ensure the savings level guaranteed by the ESCO are met (Dunsky Energy Consulting & Verterra Group Environmental Services, 2019).

- Barriers identified:
  - i. Program requires initial capitalization. In its 2019 detailed operational study of its Local Efficiency Financing Program, the Town of Bridgewater determined that, to retrofit 2340 single-family buildings and 400 small MURBs, an initial financing of $4M would be required.
  - ii. ESCOs might not wish to enter the residential market if they deem it too risky. Residential customers are more likely than large commercial customers to default on a contract, which can discourage companies from seeking out residential customers. (Palmer, Walls, & Gerarden, 2012)
  - iii. Market barriers may remain too high to see a significant uptake in the participation rate by home and building owners.

Home Improvement Energy Service Company

Sealed is an energy service company doing business in New York State that pays for energy efficiency upgrades and equipment for residential customers in exchange for service payments equal to their energy savings (so Sealed earns all the savings benefits). As an ESCO, Sealed is paid based on actual reductions in energy use.

- Barriers addressed:
  - i. Sealed found that customers were less motivated by the concept of savings over time and instead were comfortable with paying roughly the same monthly bills while receiving the added value from energy-efficiency retrofits, such as improved home comfort and more consistent heating and cooling through the elimination of air leaks. Customers were already accustomed to paying their energy bills, so a small variation in billing was an easier adjustment than taking out a loan. In some cases Sealed takes over as the billing agent for the homeowner's utility bills. The homeowner pays Sealed a monthly bill that covers the efficiency investment and—in cases when it acts as the billing agent—the customer's energy use.
  - ii. The methods of energy-efficiency upgrades have not been systematized enough for large investors to be comfortable providing pools of capital that would cover whole portfolios of households. Energy-efficiency companies are trapped in a loop where they are unable to get a low cost of capital because of a lack of performance data and cannot collect more data since they do not have the capital to make investments. To overcome this, New York Green Bank capitalized a "Special Purpose Vehicle" or SPV to finance the efficiency upgrades that Sealed performed and manages billing and loan repayment. The SPV established loan-performance history for residential energy efficiency by demonstrating to larger capital providers that efficiency upgrades can generate steady and predictable cash flows.
  - iii. The main risk that NYGB needed to mitigate in the transaction with Sealed was the risk that the assets would not perform as projected. Sealed developed an actuarial model that uses historical data on how homes use energy before and after retrofits occur. This mitigates the uncertainty around how individual technologies and behavior affect performance, capturing the broader

energy usage. Effectively, the problem of replicating energy-efficiency results gets abstracted because validation data come from multiple sources (Johnson & Molta, 2017).

Super ESCO

A Super ESCO is an entity set up by public and/or private investors that offers complete energy performance contracting services, including adapted financing, to its clients and subcontracts project implementation to private-sector ESCOs that guarantee the expected energy savings to be realized. Generally they are set up to coordinate the large-scale implementation of energy efficiency projects, primarily in hospitals, schools, municipalities, government buildings and other public facilities, where the efficiency potential is substantial, but the implementation of energy savings programs is complicated. The Super ESCO model is based on subcontracting ESCOs as implementing agents: Super ESCOs finance projects implemented by ESCOs and take on the commercial risks through a shared savings agreement with energy end users while leaving the technical risks to subcontracted ESCOs (Econoler, 2017).

- Opportunities
  - i. Super ESCOs make it easier to identify untapped opportunities for using EPCs in target markets and are perceived not as competitors of ESCOs but as facilitators that help develop and grow the market.
- Barriers addressed:
  - ii. The Super ESCO concept was developed to address barriers inherent to the Energy Performance Contracting model, including:
    - where project sizes are too small to support an ESCO's development and transaction costs by efficiently managing small-scale projects and bundling them to launch larger tenders to attract ESCOs and reduce transaction costs; and
    - to address the bias perception related to the development and implementation of Measurement and Verification of generated energy savings by ESCOs by taking over this function or having it done by a 3rd party.
- Where public agencies may otherwise lack interest in energy savings measures or have a limited budget for such projects, Super ESCOs can conduct their own market campaigns, create incentive mechanisms for public agencies to execute such projects and gain funding through project financing.
- Contracting with a Super ESCO may overcome public sector procurement related restrictions, as public agencies find it easier to contract with government-backed entities.

Energy Efficiency Investment Corporation (EEIC)

An EEIC is an organization capitalized with funds that are used to invest in local efficiency projects. Traditionally they operate by offering loans and tax credits to companies undertaking facility improvements. EEICs will frequently partner with other institutions and can be structured to have discretion in the types of projects they support, allowing them to structure investments in the way that makes the most sense for specific project costs. This flexibility allows participation in a range of financing vehicles (McEwen, 2018).

- Opportunities:
  - i. EEICs bring together both efficiency and financial expertise and capabilities under one roof. This combination can allow the institution to cultivate projects with local building owners, lead other private capital providers to strong efficiency projects, and help other financial institutions gain comfort with the investment analysis of efficiency projects.
- Barriers identified:
  - ii. Setting up an EEIC requires a significant investment of upfront capital in order to pay for staff and to extend loans.
  - iii. EEICs must set their interest rate high enough to provide a return to funding EEIC overhead and operations while not

being too high to deter participation by potential borrowers.

Energy-as-a-Service (EaaS)

Energy-as-a-service (EaaS) is a business model wherein a company owns the relevant equipment, and provides it to customers who pay fixed bills for related heating and cooling services. EaaS provides access to equipment via a service contract, rather than a financing or leasing agreement (Drainie, 2018).

- Opportunities:
  - i. EEAS clients benefit from avoiding direct energy payments, expensive upgrades for electrical equipment or software, and/or device management while still benefiting from the use of a more energy-efficient device.
  - ii. EEAS contracts provide long-term certainty of income (for the provider) and cost (for the client).
  - iii. Because the ownership of the energy equipment is retained by the company, EaaS business models can enable companies to recapitalize and invest in new projects. In 2018, CoPower, a Canadian sustainable online investment platform, made a $6.4m investment in a portfolio of geothermal projects owned by Geotility. The investment was made with capital raised through a green bond offering: in addition to having an equity stake in the geothermal projects, bondholders receive "interest" from the bill payments from customers. The investment recapitalized the company that owned and operated the projects, allowing them to develop new geothermal projects.
- Barrier addressed:
  - iv. Some energy systems, such as residential geothermal systems, are expensive to install upfront. Offering these systems as a service can make them more accessible.
- Barriers identified:
  - v. EEAS providers retain ownership of installed equipment, an arrangement to which some building owners may not be amenable.
- Role for Communities
  - vi. A master-planned community in Kelowna integrated geothermal heating and cooling as a service into the planning of the neighborhood, and the resulting construction of homes.

FINANCING MECHANISMS

A financing mechanism is the means by which an entity – company, organization, or program – receives the financial resources it needs to operate.

Energy Savings Performance Contract

The Atmospheric Fund (TAF) incubated a stand-alone entity, Efficiency Capital (EC), to help building owners in the Greater Toronto Area finance energy efficiency retrofits without drawing on capital reserves. After an ESPA is signed, EC pays for energy efficiency retrofit, and building owners repays EC through resulting savings over a term of up to 10 years. Once the term of the agreement is complete, the building owner owns all installed equipment and benefits from all ongoing savings (The Atmospheric Fund, 2017).

- Opportunities:
  - i. EC covers up to 100% of project costs.
- Barriers addressed:
  - ii. EC assumes risk for performance of the retrofit and responsibility for equipment.
  - iii. Allows building owners to finance energy efficiency retrofits without drawing on capital reserves – the building's capital is preserved and can be used for other purposes.
  - iv. Based on accounting research performed by TAF, as a service performance agreement, the ESPA does not qualify as debt: because payments are entirely contingent upon savings, agreement is not an asset or obligation on the building owner's balance sheet or lien on the property.

v. No PACE-style borrowing bylaw required.

- Barriers identified
  vi. EC retains ownership of installed equipment throughout the term of the ESPA, an arrangement to which some building owners may not be amenable.
- Program status:
  vii. Efficiency Capital is currently operating. No evidence that the ESPA model is in use by anyone else in Canada.

Deferred Home Improvement Assistance (HIA) Loans

HIA Loans are secured loans against home equity provided to low-income families for home improvements. With deferred HIA loans there are no monthly repayments: the loan can be repaid when the house is sold, or when the deed is transferred into someone else's name (Tampier, 2008).

- Opportunities:
  i. By delaying loan repayment or making it contingent on home sale, deferred HIA loans can be an effective means of addressing energy poverty.
  ii. Deferred HIA loans split the difference between traditional grants and loans, enabling the homeowner to start benefiting from home energy improvements immediately, while still establishing a long-term repayment proposition.
- Barriers identified:
  iii. The amount a homeowner can borrow money for is often limited to a percentage of the equity they hold in their property.
- Program Status
  iv. The Scottish government offers Home Energy Scotland (HES) loan and Home Energy Efficiency Programme for Scotland (HEEPS) equity loans at 0% which are repayable upon the sale of the property.

Property Assessed Clean Energy (PACE)

PACE financing programs allow municipalities to finance the up-front cost of energy or other eligible improvements on an eligible private property. The loan takes the form of an Local Improvement Charge (LIC), and the property owner then pays the costs back over time through a voluntary assessment on the property.

- Barriers addressed
  i. PACE financing is secured as a senior lien on the property and is repaid along with other municipal charges and assessments on the property tax bill, which provides robust repayment security.
  ii. PACE loans can be more accessible to building owners with lower credit ratings than private loans because they are secured by the property itself and paid as an addition to the owners' property tax bills.
  iii. A PACE assessment is a debt of property, meaning the debt is tied to the property as opposed to the property owner(s). In turn, the repayment obligation may transfer with property ownership if the buyer agrees to assume the PACE obligation and the new first mortgage holder allows the PACE obligation to remain on the property. This can address a key disincentive to investing in energy improvements because many property owners are hesitant to make property improvements if they think they may not stay in the property long enough for the resulting savings to cover the upfront costs.
- Barriers identified
  iv. PACE loans are available only to property owners.
  v. Enabling legislation can limit the kinds of properties that municipal PACE programs can affect.
  vi. Since they are structured as LICs, only local governments that administer property taxes can provide PACE loans.

vii. Municipal debt limitations can limit that amount of financing they can provide through PACE programs.

- Program status
  viii. PACE programs are offered in several Canadian provinces and communities. Provincial Municipal Acts can empower municipalities to provide PACE financing for private residential and/or commercial building energy projects. Currently, legislation in the Yukon and Northwest Territories; and the Provinces of Alberta, Ontario, and Nova Scotia enable municipal PACE programs; legislation in Saskatchewan is currently being developed. British Columbia, New Brunswick, and Manitoba have third-party lending programs. Other provinces' legislation and regulations specify that LICs can't be used to fund projects on private property; narrowly restrict the types of projects LICs can be used to fund; or are ambiguous about the application of LICs to private building energy projects, discouraging municipalities from allocating time and resources to develop LIC financing proposals (Duffy & Fussell, 2011).

On-Bill Financing (OBF) Programs

OBF programs are characterized by a utility or lender extending financing to a utility customer (such as an owner-occupant) for energy efficiency upgrades or investments, with the utility then collecting regular monthly payments to repay the loan and recoup their investment or that of a third party. These programs are often used to facilitate the upgrade of a heating or cooling system and generally take one of two forms: 1) on-bill repayment, which involves non-utility private capital, and on-bill financing, which involves public or utility capital. Loans are repaid on the customer's utility bill (McEwen, 2018).

- Opportunities:
  i. These programs are most viable for municipalities that own their local energy utilities (Duffy & Fussell, 2011).
  ii. This form of financing is typically treated as an operating expense, which makes it attractive to commercial and institutional entities that can use this accounting treatment (Financing Energy Efficiency Retrofits in the Built Environment, 2016).
- Barriers identified
  iii. OBF programs are only viable for municipalities that own their local energy utilities (Duffy & Fussell, 2011).
  iv. OBF loans are typically secured by the right to disconnect supply if left unpaid, which can exacerbate energy insecurity risks.
- Barriers addressed:
  v. OBF's mechanisms can address some of the key barriers to energy-efficiency investment, including:
  vi. High upfront costs of energy-efficiency retrofits
  vii. High interest rates for third-party financing
  viii. Homeowners for whom the length of ownership is a concern
- Program Status:
  ix. There are several OBF programs currently active across Canada, including in British Columbia, Manitoba, Newfoundland, and Nova Scotia.

Green Mortgage

A green mortgage is a mortgage offered by a lender that offers a reduced interest rate to borrowers buying an energy efficient home. This could be a construction mortgage used to build a new home to a specific energy efficiency rating; a mortgage-extension or re-mortgage intended to enable an energy efficiency retrofit; or a traditional purchasing mortgage for a home with a minimum qualifying energy efficiency rating (Brown et al., 2019).

- Barriers identified
  i. While a significant proportion of the costs of owning and operating a property relate to energy, most lending institutions do not factor energy costs

into their mortgage underwriting methodology.

Revolving Energy Fund (REF)

A REF is a capital pool that is dedicated to funding energy efficiency, renewable energy, and/or sustainability projects that generate cost savings. A portion of those savings are used to replenish the fund. REFs are usually internal to organizations or entities but can also operate at a community level (Sinnot, 2018).

- Opportunities:
  - i. Cost savings are "revolved" to the fund, allowing for reinvestment in future projects of similar value. This establishes an ongoing funding vehicle that helps drive energy efficiency and sustainability over time, while generating cost savings and ensuring capital is available for future projects.
  - ii. In addition to energy savings, internal REFs can generate savings through utility and maintenance cost avoidance, and leverage rebates from external energy efficiency programs – if factored into the savings, these can increase the rate of replenishment and the size of the REF beyond the original investment.
- Barriers identified
  - iii. REFs require an input of seed capital to get started, along with top-up funds, potentially, in subsequent years to make sure the fund does not run out of money as it makes investments.
- Program Status:
  - iv. Oshawa, Ontario established a REF in 2019. (Sinnot, 2018)
  - v. Community-Owned Renewable Energy Mullumbimby (COREM) is a volunteer-run, not-for-profit, community group in Mullumbimby, Australia that aims to support the transition of its community to renewable energy. COREM funds and coordinates installation of solar generation and solar hot water for local community groups. COREM has developed a Community Revolving Energy Fund to offer interest free loans to install solar PV, solar hot water and energy efficiency equipment. Community associations pay back the installation of the equipment through savings of electricity costs.

ENERGY SAVINGS CERTIFICATES (ESCS)

ESCs are tradable certificates that represent a set amount of energy savings from efficiency projects. In jurisdictions in which a utility has been mandated (generally through legislation) to reduce its expected energy load or load-growth, or meet a percentage of its energy sales, through end-use energy efficiency, compliance markets can be established through trading programs that allow utilities to purchase ESCs generated by third parties through energy efficiency projects or investments in order to meet energy savings targets (World Resources Institute, 2008).

- Barriers addressed
  - i. Within a compliance market, ESCs can serve as an additional revenue stream to improve the economics of an energy efficiency project.
- Barriers identified
  - ii. The process of measuring the energy efficiency savings represented by ESCs requires establishing a baseline for energy use and/or demand before and after the implementation of an efficiency project.
  - iii. While voluntary markets do exist, ESCs operate primarily within compliance markets – meaning within jurisdictions in which utilities have mandated energy saving targets and a trading program has been established.
- Program Status
  - iv. In the US, a number of ESC programs exist at the state level. Several countries have national programs.

FINANCIAL ENHANCEMENTS

Public funds can be leveraged to facilitate or enhance private investments to make lending more attractive to lenders and/or loanees. This can be done proactively, such as by blending public money with private capital in a single fund, or through abatement, such as through property tax calculations that enhance business cases for private investments in energy efficiency.

CREDIT ENHANCEMENTS

Credit enhancements are tools offered by a third party (typically government) to encourage lenders to offer longer term financing and/or lower interest rates than they otherwise would have, or to offer financing to customers who would not have been otherwise considered credit-worthy. Credit enhancements can be combined with many of the financing repayment mechanisms (e.g. LIC) to further encourage private sector investment in energy efficiency (WHEEL: A Sustainable Solution for Residential Energy Efficiency, n.d.).

- Opportunities
  - i. Credit enhancement strategies have lower capital requirements than direct financing tools and repayment mechanisms such as low interest loans, efficiently leveraging public dollars to mobilize private capital by de-risking investment.
  - ii. Credit enhancement strategies can reduce the cost of capital for retrofit projects, increasing uptake and enabling deeper retrofits.
- Barriers identified
  - iii. Actual provision of energy efficiency financing is still reliant on the capacity and interest of private sector investors/ lenders.

INTEREST RATE BUY-DOWNS (IRB)

Governments can subsidize the interest rate on private loans to encourage uptake of energy efficiency loans, thus making the loan more affordable and improving the business case for the home or building owner.

Typically, IRBs are paid to the lender in a single upfront sum equal to the present value of the covered interest rate spread over the loan value and period (WHEEL: A Sustainable Solution for Residential Energy Efficiency, n.d.).

- Barriers addressed
  - i. IRBs have demonstrated ability to increase the attractiveness of and encourage participating in energy efficiency financing programs.
- Barriers identified
  - ii. Because interest charges accrue significantly over time, IRBs tend to be an expensive option for longer term lending, and are thus more commonly applied to short or medium term loans and leases.

LOAN LOSS RESERVES (LLR)

LLRs credit enhancement tool wherein a reserve fund is established, often with public funding, and set aside to cover a portion of losses incurred by lenders due to borrower defaults.

- Barriers addressed
  - i. LLRs can reduce the risk, real and perceived, of less well-known or -established investment opportunities, thereby attracting investors who might otherwise be too risk averse or constrained.
  - ii. LLRs have demonstrated ability to improve accessibility/affordability of energy efficiency financing programs by allowing financing to be provided to building owners who might not otherwise be deemed credit worthy.

BLENDED FUNDS

Blended funds combine public money with private capital in a single fund, with the former being used to mobilize or "crowd-in" the latter by mitigating risks or rebalancing risk-reward profiles to attract private capital investments. This might be done through providing

loans at concessional (i.e. lower than market) rates to make overall financing attractive while giving private investors a higher rate of return, or assuming the junior debt position by occupying a high risk tranche of the fund.

THE MAYOR OF LONDON ENERGY EFFICIENCY FUND (MEEF)

The MEEF is a £500m investment fund that supports projects that deliver new low carbon technology or upgrade existing infrastructure to help London achieve its net zero by 2030 targets. These include making buildings and infrastructure more energy efficient and ensuring they are supplied with clean sources of heat and power and supporting low carbon transport in the capital.

The MEEF was initially capitalized by GBP 43m the Greater London Authority (GLA) using European Regional Development Funds (ERDF). MEEF Fund Manager, Amber Infrastructure, is responsible for sourcing projects and attracting additional funding from other investors (i.e. banks and other financial institutions) on top of the European Investment Bank (EIB) and project promoters.

- Barriers addressed:
    - i. MEEF gives the public sector oversight needed to set and monitor achievement of the Fund's objectives, while giving the private sector the freedom and incentive to drive investment: The GLA maintains control and oversight of the MEEF by selecting the Fund Manager; through involvement in an Advisory Committee, which provides strategy guidance to the Fund Manager, and through an Internal Monitoring Committee, made up of senior staff from the GLA and external experts, which is in charge of contract management and provides advisory services to the GLA regarding the Fund's performance and its objectives (European Investment Bank (EIB) & PwC EU Services, 2018).
- Program status:
    - ii. Launched in 2018 and currently operational.

CANADIAN CLIMATE ACTION ACCELERATOR TO NET ZERO (CAANO)

The Canadian Climate Action Accelerator to Net Zero (CAANO), a retrofit financing program model being developed by the MaRS Discovery District, will offer municipalities comprehensive third-party support from project origination to execution, utilize blended finance structures to engage public and private investors in innovative debt-based financing arrangements, and have the flexibility to invest in and execute retrofit projects on a range of both public and private assets. Each instance of the program will involve a fund manager who can generate a pipeline of investment-ready projects that can be aggregated into investable portfolios with marketable returns in order to streamline the investment process and attract the necessary scale of capital. Energy and operational savings generated by project portfolios will be used to repay investors (Ryan et al., 2021).

- Opportunities:
    - i. The CAANO investment model addresses the needs of large public and private institutions actively looking for sustainable investment opportunities across Canada to action their sustainable investment commitments.
    - ii. The Fund Manager leverages the capital commitments from Public and Municipal Investors to engage Private Investors, such as banks, credit unions, and pension funds, and, in some cases, additional large scale Public Investors. Blending public and private capital will allow CAANO to engage a broad range of investors with different investment profiles.
- Barriers addressed
    - iii. CAANO was designed specifically to address the barriers to energy retrofit financing and action faced by small and mid-sized municipalities, including
    - iv. Lack of staff capacity to identify, evaluate,

and execute sustainable infrastructure projects at the scale and pace necessary to meet their climate objectives.

v. Struggle to build the business case for approving a pipeline of investable, GHG and cost-saving projects.

vi. Constrained ability to drive climate action on private assets within their boundaries

vii. By employing a cohort model of municipal participation, CAANO can generate sufficient fund investment size to generate the required deal flow and leverage economies of scale in project execution.

- Barriers identified

viii. Private investors are hesitant to invest in a new asset class with limited exposure and financing history.

- Program Status:

ix. In 2023, the CAANO program model will be piloted by 3 municipalities each in British Columbia and Ontario. These pilots are intended to test the model in two distinct Canadian regions, validate design principles, and inform its operational structure.

TAX INCENTIVES

A tax incentive is a provision of a jurisdiction's tax code designed to incentivize or encourage a particular economic activity through reduced tax payments. While tax incentives can generate funds not appropriated directly from the public budget, the enabling jurisdiction still incurs loss through forgone tax revenue.

TAX INCREMENT FINANCING (TIF)

TIF is a public financing method that is used as a subsidy for redevelopment, infrastructure, and other community-improvement projects in many countries to stimulate private investment. Through the use of TIF, municipalities divert future property tax revenue increases from a defined area or district toward an economic development project or public improvement project in the community. In a TIF financing program, the base property tax of a targeted development property or district is frozen, and the anticipated increase in the property tax that is to result from redevelopment - that is, the increment - is used to finance the development project. The TIF program eventually expires, at which time the property taxes begin to flow to the municipality.

TIF is enabled through legislation in several Canadian provinces: Alberta, through the Municipal Government Act; in Ontario, through the Tax Increment Financing Act, and Manitoba, through the Community Revitalization and Tax Increment Financing Act. The Enabling legislation gives local governments the authority to designate tax increment financing areas. The designation usually lasts 20 years, or enough time to pay back the bonds issued to fund the improvements. While arrangements vary, it is common to have a city government assuming the administrative role, making decisions about how and where the tool is applied (McEwen, 2018).

- Opportunities:

i. Some cities have found that the completion of a project on one property often results in an increase in the value of surrounding real estate and overall economic activity, which generates further tax revenue in addition to the repaid loan.

- Barriers identified:

ii. Enabling legislation specifies the types of projects that may be undertaken with TIF. Depending on the regime, energy efficiency may be specified or not; may be specifically excluded; or may be required, officially or not, as part of a TIF agreement.

- Program status:

iii. In Canada, TIF programs are in use in several municipalities. The American cities of Chicago and Milwaukee have successfully used TIF to install green infrastructure.

PROPERTY TAX ABATEMENT

A tax abatement is similar to a deduction or tax credit.

A tax abatement is typically used to eliminate or reduce the level of property tax faced by an individual or firm for a period of time. Governments can use tax abatements to encourage certain types of activities related to energy. To encourage the use of energy from renewable sources, governments can offer a tax abatement to the owner of the property that uses particular types of energy (McEwen, 2018).

- Opportunities:
  - i. Program administration costs can be lowered through reliance on existing "tax and revenue" department staff.
- Barriers identified:
  - ii. Cities would need to determine abatement levels and the method of assessment.
  - iii. Tax abatement programs have the potential to reduce public revenues if they are successful in encouraging existing firms to participate but not in attracting new firms to locate in the area.
  - iv. While tax abatements can stimulate growth to an area there is a danger that it can overstimulate the market in the area which can negate the beneficial effects of an abatement for firms. (Tax Abatement - Energy Education, n.d.)
- Program Status:
  - v. New or expanded businesses in the State of Nevada may apply to the Director of the State Office of Energy for a property tax abatement of up to 55% for up to 20 years for real and personal property used to generate and store electricity from renewable energy resources including solar, wind, biomass*, fuel cells, geothermal or hydro. Generation facilities must have a capacity of at least 10 megawatts (MW), and must plan to be in operation for at least 10 years. Facilities that use solar energy to generate at least 25,840,000 British thermal units of process heat per hour can also qualify for an abatement (Large Scale Renewable Energy Property Tax Abatement, 2022)

OPPORTUNITY ZONES FUNDS (OZONES)

OZones are an economic development tool that provide tax incentives to encourage people to invest in "distressed" areas in the United States. Their ostensible purpose is to spur economic growth and job creation in low-income communities by spurring investments of patient capital. In the USA, Opportunity Zones (OZones) were codified in the Federal Tax Cuts and Jobs Act of 2017 (Parzen & Richard, 2019).

- Opportunities:
  - i. OZones can be used to raise lower-cost private capital to facilitate clean energy projects in qualifying communities because the capital provider should be willing to accept a lower cash return because it is receiving a significant part of its return in the form of tax benefits and willing to forgo or significantly reduce the risk premium they would otherwise demand for investing in an economically-distressed area.
- Barriers:
  - ii. Small and medium size local governments often do not have the capacity to set the table for Opportunity Zone investment. They need access to upfront project predevelopment, de-risking and expert technical assistance to help them develop an "investable" pipeline of projects.
  - iii. The growth of a pipeline of deals could be faster and the impact higher if there were coordination, sharing, and rapid dissemination of models and processes to support local deal development.

NON-FINANCIAL ENHANCEMENTS

A strong business case is foundational and necessary to drive investment in community energy initiatives. However, it is not always sufficient to guarantee widespread and quick uptake. Non-financial support may be needed to build sectoral capacity and provide

the necessary catalysts for investment.

CAPACITY BUILDING STRATEGIES

Entities will require a certain facility or capability in order to undertake a given task; where it is insufficient, capacity building strategies aim to improve the entity's capacity such that it is sufficient to the task.

EUROPEAN CITY FACILITY (EUCF) PROGRAM

The EUCF was designed to target a specific need of cities: the development of financial know-how and capacities. It supports municipalities/local authorities, their groupings, as well as local public entities aggregating municipalities/local authorities across Europe to develop credible investment packages and mobility finance to accelerate investments in sustainable energy. It provides targeted financial, technical, legal and capacity building support; standard tools and documents; and technical and financial expertise at the local level to support the development of and validate investment concepts. It also has a grant allocation mechanism to give local governments the resources to describe their investment needs (What Is the EUCF, n.d.) (Bourgeois, 2021).

- Opportunities:
  - i. The EUFC aims to connect more than 10,000 local governments to encourage replication and catalyze further action across European cities.
  - ii. The facility aims to bring together the expertise of cities and the financial world to empower cities to develop their know-how and gain access to a variety of new sources of funding.
- Barriers Addressed:
  - iii. EUCF bridges two fundamental barriers to sustainable energy investments at the local level (What Is the EUCF, n.d.):
  - iv. Lack of financial and legal capacity to transform local long-term energy and climate strategies into appropriate investment concepts.
  - v. Lack of aggregation of fragmented smaller projects (for example in the building sector) and thus lack of attractiveness for the financial sector
  - vi. Cities experience difficulties in accessing the funds made available to them. Indeed, there is a disconnect with the culture of the financial world; they lack the capacity to prepare a well-structured plan to respond to a call for projects. Similarly, the finance and investment world is unfamiliar with how cities operate
- Program Status:
  - vii. Operational

THE ATMOSPHERIC FUND'S (TAF) RETROFIT ACCELERATOR

TAF's Retrofit Accelerator provides expert services to deliver deep energy retrofits in the multi-family building sector in the GTHA. Accelerator staff provide technical and project support to project teams by: helping building owners to plan and execute projects, and understand technical materials; familiarizing contractors with the techniques and technology needed to implement deep retrofits; helping to identify financing opportunities and grants; and sharing learnings, standard packages, and approaches to help make projects more efficient and affordable. As of 2022 there is no established program model for the accelerator: TAF staff are still learning as they do, and developing a community of practice to drive learning and knowledge sharing.

- Opportunities:
  - i. TAF sees Retrofit Accelerators as temporary initiatives necessary to develop local markets. They spearheaded an advocacy campaign to the Federal government that led to $200M in the 2022 Federal budget being earmarked to set up Retrofit Accelerators regionally or sectorally to develop additional markets.

INVESTMENT FACILITATION STRATEGIES

Investment facilitation strategies aim to make

conditions or opportunities more attractive to investors or conducive to investment.

DIGITAL PLATFORMS

The SUNSHINE Platform is an online platform designed to support all phases of an EPC (Energy Performance Contract) project, reducing barriers to complex building renovations by ensuring efficiency, transparency, and standardization. The platform aims to facilitate the entire process of building renovation projects from conception to monitoring and maintenance. A series of stakeholders is involved in the different project phases: planning, execution of the renovation, and maintenance and monitoring of the renovated building – the SUNSHINE Platform is a place where they can all cooperate and go through the project phases together. It follows each step of project implementation from initial concept to aggregation while ensuring high levels of legal and financial security, transparency, and respect for the needs of each stakeholder (Stancioff et al., 2019).

- Opportunities:
  - i. Facilitates collaboration by allowing better, faster and more effective communication among project partners.
  - ii. Provides residents with access to information about energy service providers
  - iii. Generates a database about buildings and projects, allowing it to generate relevant statistics to the different stakeholders involved.
  - iv. Reduces the projects' administrative costs (especially for the ESCOs), since the platform centralizes, standardizes, and digitalizes the information and project-related documentation, and simplifies the communication flow during the project.
- Barriers identified
  - v. There are minimum systems requirements to install and run the platform
- Program Status:
  - vi. The SUNSHINE Platform was launched in 2019 and is currently being tested in six different countries (Poland, Romania, Slovakia, Austria, Bulgaria, and Latvia) through the funding of the EU project FINEERGo-Dom schemes.

INVESTOR CONFIDENCE PROJECT (ICP)

Green Building Canada's ICP consists of a series of protocols that define industry best practices for energy efficiency project development and a credentialing system that provides third-party validation. The Protocols allow project developers to use a ready-made set of technical standards consisting of accepted industry standards and best practices during the design phase of the retrofit project. The goal of the project is to establish energy efficiency as a specific asset class that will enable and encourage capital markets to invest in building renovations: projects that conform to the requirements of the ICP protocols and have been originated and verified by a credentialed project developer and quality assurance provider are deemed to be "Investor Ready" (Green Building Canada's the Investor Confidence Project (ICP), n.d.).

- Opportunities
  - i. Though they don't guarantee savings, credentialed projects create confidence with building owners and investors, thereby encouraging greater adoption.
  - ii. Standardization streamlines energy renovation transactions, increases the reliability of projected energy savings, and allows retrofit project investment opportunities to be compared by prospective investors.
  - iii. ICP certification is a requirement to participate in the Canada Infrastructure Bank's Commercial Building Retrofits Initiative

BUILDING ENERGY CONSUMPTION LABELING

An energy label is a rating that indicates a building's energy performance compared to similar buildings. Energy labeling programs can make energy performance 'visible' to consumers through validated and easy-to-understand energy labels.

- Opportunities
  - i. Energy labeling allows energy efficiency to be considered in real estate decisions and improves the business case for energy efficiency investments. Disclosure and labeling programs can help encourage energy efficiency and are an important part of many market-transformation strategies.
  - ii. Energy labeling regimes provide a mechanism for markets to value both home energy performance and home energy improvements
  - iii. In North America, the Multiple Listing Service® real estate industry database can include energy-use data, home energy ratings, and information on a property's energy efficiency characteristics.
- Barriers addressed
  - iv. Well-designed and successful home energy efficiency policies depend on the existing infrastructure involved in home construction, sales, and performance analysis.
  - v. Energy labeling regimes can facilitate the identification and appreciation of energy efficiency properties by potential buyers, which can in turn reduce the reluctance of property owners to invest in energy efficiency retrofits that they may not realize the full financial benefit of and facilitate the transference of PACE liens between owners when properties change hands.
- Barriers identified
  - vi. In British Columbia, local governments currently lack the authority to require home energy labeling. (Briefing Note: Home Energy Labeling, 2020).
- Program Status
  - vii. Since 2006, all 28 European Union member states have required energy performance labels for all buildings. Labels must provide details to prospective buyers/tenants at time of construction, rental, or sale. Home energy labelling disclosure is required throughout the European Union.
  - viii. In the United States, some form of home energy disclosure is required in at least five states (Alaska, Connecticut, Hawaii, Kansas, Massachusetts, and South Dakota) as well as cities such as Austin TX, Berkeley CA, Chicago IL, Minneapolis MN, Montgomery County MD, and Portland OR.

THE ENERGY EFFICIENCY FINANCIAL INSTITUTIONS GROUP (EEFIG) UNDERWRITING TOOLKIT

The EEFIG Underwriting Toolkit is designed to assist financial institutions to scale up their deployment of capital into energy efficiency. It includes sections intended to: help financial institutions better understand the nature of energy efficiency investments and therefore better evaluate both their value and the risks; provide a common framework for evaluating energy efficiency investments and analyzing the risks; help developers and owners seeking to attract external capital for energy efficiency projects to develop projects in a way that better addresses the needs of financial institutions; and fost a common language between project developers, project owners and financial institutions (Fawkes & EEFIG Derisking Project Consortium, 2017).

- Opportunities
  - i. By using the Toolkit, Banks and financial institutions can play an active role in ensuring financed projects of all types achieve optimum levels of efficiency over and above business as usual by adjusting the lending/investing process to include queries about energy efficiency and the provision of assistance to identify viable projects. By doing this, they can reduce their lending risks by financing measures that improve customers' cash flows and potentially increase lending.

CLEAN ENERGY FINANCING REGULATORY FRAMEWORK

In 2018, the EU adopted a package of measures on

sustainable finance including: a unified regulatory framework for classifying 'environmentally sustainable economic activity'; regulations on disclosure obligations for integrating ESGs into risk/investment decision-making; and regulations on low-carbon and positive-carbon impact benchmarks, intended to provide investors with better information on the carbon footprint of their investments (Hudgson, 2019).

- Opportunities
  i. Requiring enhanced disclosure of climate-related risks and opportunities would in theory encourage investors to consider a firm's potential for long term business success in the transition to net-zero when making investment decisions.

ENERGY MANDATES

A mandate is a formal, mandatory order issued by a relevant authority to those under its power that requires, guides, or restricts activities.

ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (EPBD)

In Europe, the European Union's EPBD sets the energy performance standards for new and existing buildings; it was amended in 2018 to accelerate the renovation of the existing building stock. The Directive does not force the Member States to apply the set of EPB standards, but does require them to explain where and why they deviate from these standards. (30) A new amendment under consideration in 2022 includes the gradual introduction of minimum energy performance standards (MEPS), regulations that require buildings to meet a minimum performance standard, set in terms of a carbon or energy rating, or minimum renovation measure, to trigger renovation of the worst performing buildings. When introduced, MEPS are embedded in a framework of financial and practical support for building owners and occupiers undertaking renovations, ensuring the standard is both effective and fair (Fawkes & EEFIG Derisking Project Consortium, 2017).

- Opportunities:
  i. Binding legislation means more business for investors: for a high risk investment, banks and pension funds have to hold back high reserves of capital. In 2017 the Institutional Investors Group on Climate Change, a group of over 130 pension funds representing 18 trillion euro, called for a binding EU energy efficiency target of at least 30% by 2030 and an annual energy savings target of more than 1.5% (Bassett et al., 2019).
  ii. The Final Report from Canada's Expert Panel on Sustainable Finance noted that "(f)or Canada's private retrofit market to develop more rapidly, the Federal government must set a clear and long term ambition for building energy and emissions performance within a reinforcing policy framework. A progressive, predictable policy and regulatory framework offers building owners and investors the necessary visibility to plan for a multi-decade investment program."(Final Report Of The Expert Panel On Sustainable Finance, 2019).

RENTAL EFFICIENCY STANDARDS

Rental Efficiency Standards establish mandatory minimum building energy performance standards for residential rental properties.

- Opportunities
  i. By making minimum building energy performance a requirement to rent a property, Rental Efficiency Standards can boost investment in energy efficiency by building owners.
- Barriers addressed:
  ii. In order to ensure that the cost of mandated energy efficiency improvements do not result in increased rent and impact housing affordability, Rental Efficiency Standards must be structured to reduce the total cost of living for the building occupants: while landlords may pass retrofit costs through

to their tenants, tenants will benefit on the whole if energy bill savings are greater than increased rent. To maintain affordability, most standards target the worst-performing homes, ensuring that most retrofits will have high energy bill savings compared to the cost of the upgrade. Additional strategies, including cost caps on upgrades, financing, incentives, and exemptions for certain properties can further improve affordability, making sure that costs remain low and benefits high.

iii. Many rental efficiency policies are implemented through existing rental licensing or certification programs where the ability to rent the property is contingent upon meeting the efficiency standard. Using an existing structure can substantially streamline the implementation process and make the policy an attractive option for a city government.

- Program Status:

iv. In 2022, the City of Burlington, Vermont approved an ordinance that sets minimum energy efficiency standards for residential rental properties, starting on January 1st, 2022.

KEY TERMS / CONCEPTS

Blended finance: the strategic use of catalytic capital or risk capacity from public or philanthropic sources to mobilize or increase private sector investment and capital flows in sustainable development. Blended finance is a structuring approach that allows organizations with different objectives to invest alongside each other while achieving their own objectives (whether financial return, social impact, or a blend of both). The main investment barriers for private investors addressed by blended finance are (i) high perceived and real risk and (ii) poor returns for the risk relative to comparable investments. (Blended Finance, n.d.)

Bond: a fixed-income instrument that represents a loan made by an investor to a borrower (typically corporate or governmental). A bond could be thought of as an I.O.U. between the lender and borrower that includes the details of the loan and its payments. Bonds are used by companies, municipalities, states, and sovereign governments to finance projects and operations.

Canada Infrastructure Bank: a Federal Crown Corporation of Canada tasked with financially supporting revenue-generating infrastructure projects that are "in the public interest" through public-private partnerships.

City Facility: a pool of financial and technical experts to support local governments when designing a project and a grant allocation mechanism to give them the resources to describe their investment needs.

Capital Mobilization: Where the financing needs of a program exceed the fiscal capacity of the public sector, capital mobilization involves using public funds, regulatory, and policy tools to mobilize necessary private capital by creating investment opportunities attractive to private and other investors.

Community Economic Development Investment Fund (CEDIF): a pool of capital that has been raised from Nova Scotian residents to invest in local for-profit small businesses and co-operatives within a community. Through investing in a CEDIF a Nova Scotia taxpayer becomes eligible for Equity Tax Credits (ETC).

Concessional Financing: concessional loans have more generous terms than market loans. These generally include below-market interest rates, grace periods in which the loan recipient is not required to make debt payments for several years, or a combination of low interest rates/grace periods.Concessional loans are often used in blended financing as the use of relatively small amounts of concessional donor funds to mitigate specific investment risks and help rebalance risk-reward profiles of pioneering investments that are unable to proceed on strictly commercial terms. Concessional funds are structured as co-investments, with an expectation of reflows for future investments or

other uses. (Blended Concessional Finance, n.d.)

Credit Enhancement: funds or assurance provided to a lender that add security to a loan, e.g. loan loss reserve, interest rate buy-down, or loan guarantee, to lower capital costs by improving the credit quality of a financial asset and by mitigating, transferring, or otherwise reducing the default and liquidity risks associated with an investment. Their main purpose is to encourage lenders to offer longer-term financing and/or lower interest rates (or finance otherwise considered credit-worthy) (Carvalho, 2018).

Debenture: a type of bond or other debt instrument which gives a creditor the right to receive a fixed number of payments over a predetermined period of time that is unsecured by collateral. Since debentures have no collateral backing, they must rely on the creditworthiness and reputation of the issuer for support.

Debt Financing: involves raising funds for business activities, making purchases, or investing, by the borrowing of money, often through a loan, which is then paid back, usually with interest

De-risking Energy Efficiency Platform (DEEP): an open source database for energy efficiency investments performance monitoring and benchmarking, based on evidence from implemented projects. The main objective of the DEEP is to improve the understanding of the real risks (especially performance risks) and benefits of energy efficiency investments based on market evidence.

Energy-as-a-service (EaaS): a business model whereby customers pay for an energy service without having to make any upfront capital investment. EaaS models usually take the form of a subscription for electrical devices owned by a service company or management of energy usage to deliver the desired energy service.

Energy Efficiency Financing Tools: tools designed to help overcome the upfront cost of energy efficiency upgrades

Energy Efficiency Investment Corporation (EEIC): an organization capitalized with funds that are used to invest in local efficiency projects. EEICs will frequently partner with other institutions and can be structured to have discretion in the types of projects they support, allowing them to structure investments in the way that makes the most sense for specific projects. This flexibility allows participation in a range of financing vehicles. The goal of the EEIC is to maximize the leverage of private financing for every dollar of internal funds.

Energy Performance Contract (EPC): an agreement between an energy service company and a client organization that is used for energy efficiency retrofit projects. Under this agreement, an energy service company assesses a facility's energy systems and equipment, identifies possible energy savings opportunities, recommends and implements energy efficiency improvements, monitors the results, and guarantees the energy savings. The energy-saving improvements and the energy service company are paid for over a specified period from the resulting energy savings. When the payout period is over, the energy service company's services and all the improvements will have been paid for – and the client organization benefits from all future savings (Natural Resources Canada, 2022).

Energy Service Companies (ESCOs): private corporations or entities that provide comprehensive energy solutions to customers (mostly building owners), including the design, implementation, and measurement/verification of energy efficiency retrofits and/or renewable energy projects.

Equity Financing: involves raising funds for business activities, making purchases, or investing, by selling a company's stock, usually in the form of ownership shares.

European City Facility (EUCF): a European initiative to support municipalities/local authorities, their groupings, as well as local public entities aggregating municipalities/local authorities across Europe to develop investment concepts to accelerate investments in sustainable energy.

Financial aggregator: a regulatory or institutional mechanism that mediates between municipalities (or other subnational actors) and capital markets. Financial aggregators can lower borrowing costs and increase market access.

Financial warehouses: act as conduits for the aggregation of smaller, illiquid loans, packaging the respective cash flows and re-issuing them as asset-backed securities or bonds to investors. Their main purpose is to remove transaction costs for participants. Though they can be independent, financial warehouses could be created by green banks to complement other programs and services.
Forfaiting: a means of financing whereby one party receives immediate value in exchange for medium- or long-term receivables – such as debts – which are purchased by a second party. The value received by the first party is immediate but discounted, while the second party assumes any risk associated with the receivables.

Green Bank: a public or quasi-public entity designed to facilitate private investment into sustainable, resilient infrastructure projects.

Green Bond: a type of fixed-income instrument that is specifically earmarked to raise money for climate and environmental projects. These bonds are typically asset-linked and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations.

Interest Rate Buy-Down (IRB): government funds used to subsidize the interest rate on private loans to encourage uptake of energy efficiency loans, thus making the loan more affordable and improving the business case for the home or building owner. Typically, IRBs are paid to the lender in a single upfront sum equal to the present value of the covered interest rate spread over the loan value and period. Because interest charges accrue significantly over time, IRBs tend to be an expensive option for longer term lending, and are thus more commonly applied to short or medium term loans and leases.

Investor Confidence Project (ICP): an international programme to increase the attractiveness of energy efficiency projects to investors by bringing together existing engineering standards and practices into a consistent and transparent framework and certifying compliant projects as "investor-ready" to reduce performance risk and due diligence costs, and enable aggregation of standardized projects.

Investment Concept: a document which translates an investment project idea into financial language in order to mobilize financing for its realization. The purpose of the Investment Concept is to provide investors and financial institutions with the information necessary to assess an investment project in a simple and fast manner, and to transform climate and energy plans into sound investment packages and thus, facilitate the access to funding for municipalities / local authorities and local public entities aggregating municipalities/ local authorities.

Leveraged Recapitalization: a type of a corporate restructuring that aims to change a company's capital structure. In a leveraged recapitalization, the company replaces part of its equity with additional debt and thereby changes its capital structure. Both energy generation projects (e.g. solar PV systems) and energy efficiency projects (e.g. retrofits) can generate returns, either through income or saving, over time. The resulting project or energy performance contract represents equity: an asset that the company owns. The company can use that asset to attract investment, liquidating its equity in both the project or contract and future returns for a lump sum of capital to "recapitalize", and have sufficient capital to pursue additional projects.

Loan Loss Reserves (LLR): a credit enhancement tool wherein a reserve fund is established to cover a portion of losses incurred by lenders due to borrower defaults.

Loan Guarantee: a credit enhancement tool wherein a government body acts as the guarantor of loans to private citizens or companies, thereby improving the borrowing terms for energy efficiency financing in the private market

Local Improvement Charges: Canadian municipalities may undertake certain municipal capital

projects as local improvements, and recover all or part of the cost of these projects through local improvement charges on properties that benefit from the work. Municipalities can often spread the cost of the improvements over several years. This helps to reduce the annual payment property owners must make. When a property owner paying local improvement charges sells their property before the local improvement charges are fully paid off, generally, the new property-owner must make the rest of the payments. LICs are the mechanism underlying PACE loans.

Mayor's Energy Efficiency Fund (MEEF): a fund that originates, invests in, and executes a wide range of sustainability projects across London which deliver carbon and energy savings to both the public and private sector. The MEEF began with £43M of public capital that has leveraged an additional £456M of private capital, and is managed by an expert third party fund manager.

Opportunity Zone: an economic development tool that encourages people to invest in economically-distressed communities in the United States. Their purpose is to spur economic growth and job creation in low-income communities while providing tax benefits or preferential tax treatment to investors.

PACE Technical Standards Manual (TSM): part of the Texas PACE-in-a-box toolkit, the TSM outlines the technical standards to be implemented in setting up PACE programs throughout Texas. The technical methodology incorporated into the review process relies primarily upon the Investor Confidence Project (ICP) Energy Performance Protocols (EPP) for Standard and large commercial Facilities. The PACE in a Box Technical Standards Manual relies on EPP because the EPP are the result of a nationwide effort to standardize the technical review of energy efficiency projects to bring uniformity and reliability on a national scale, and can help ensure standardization in Texas.

Project Aggregation: blending a number of projects together into a single portfolio of projects. Similar to an index fund (rather than a single stock), it allows investors to perform transactions with less risk and invest in a number of projects in a single transaction rather than multiple transactions.

Project Aggregator: a project developer that actively aggregates smaller projects into a larger project pool.

Property Assessed Clean Energy (PACE): a mechanism for financing energy efficiency and renewable energy improvements on private property. PACE programs allow a property owner to finance the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through a voluntary assessment. The unique characteristic of PACE assessments is that the assessment is attached to the property rather than an individual.
Property Tax Abatement: Reducing property taxes based on observed energy performance to incentivize owner-occupants to invest (self or third-party) in energy efficiency upgrades.

Securitization: the process through which certain types of assets, often contractual debts such as mortgages or loans, are pooled so that they can be repackaged into interest-bearing securities. The interest and principal payments from the assets are passed through to the purchasers of the securities.

Security: A security is an exchangeable financial instrument that represents some type of financial value. Common examples of securities are stocks and bonds.

Special Purpose Vehicle (SPV) or Special Purpose Entity (SPE): a legal entity that has been established to fulfill a specific objective and separate an asset, subsidiary, or financial transaction from a larger government agency by keeping it "off" the agency's balance sheet. Public funding can be used to set up an SPV and finance a portfolio of retrofits. Once those projects have been completed, performance data can be captured over time: the consistency of the cash flows, the number of defaults, and the speed with which they can originate new deals. These metrics are all similar to what institutional investors require from other investment vehicles -- the SPV's loan portfolio can be sold/securitized, freeing up capital to finance more retrofits.

The Split Incentive Problem: Rental and lease agreements often create a condition known as "split incentives"' between owner and tenant: landlords have little incentive to improve home efficiency when they do not pay energy bills, and tenants have little incentive to make improvements to a home when they may not be present to reap the full benefits of that investment (Glassman & Ayyagari, 2021). This phenomenon is a major barrier to improvements in the energy efficiency sector and investment in energy-saving retrofits (Split Incentives and Green Leases, n.d.).

Super ESCO: a specialized entity set up by public and/or private investors to support capacity building and project development by identifying business opportunities in specific energy markets by offering full Energy Performance Contracting services, including adapted financing, to its clients, and subcontracting project implementation to private-sector ESCOs that guarantee the expected savings to be realized.

Tax Increment Financing (TIC): project financing through loans to property owners to implement efficiency-related improvements to their property. In return, the building owner agrees to a higher tax assessment based on the increased property value that results from the project.

Taxonomies: definitions of sustainable finance that aim to be comprehensive classification systems. When appropriately designed, sustainable finance definitions and taxonomies can improve market clarity. More precise and consistent definitions of which investments are "green" and "sustainable" could facilitate investment by giving confidence and assurance to investors.

Yield Company (YieldCo): an entity formed to own operating assets, such as solar or wind power generating facilities, and to raise funds by issuing shares to investors. Cash flows from these operating assets are then used to distribute dividends (cash payments) to shareholders over time.

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The Next Chapter: Creating an understanding of Special Purpose

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APPENDIX B: LITERATURE REVIEW NARRATIVE REPORT

QUEST

AGGREGATING LOW CARBON ENERGY PROJECTS FOR INVESTMENT
LITERATURE REVIEW NARRATIVE REPORT

BACKGROUND

Canadian communities are increasingly developing low-carbon, local energy projects, but they face road-blocks when it comes to financing these projects. Canadian investors are increasingly seeking low-carbon investments, but are challenged to find these locally and at a scale large enough for investing.

The Aggregating Low Carbon Energy Projects for Investment (ALCEPI) project aims to address the challenges stated above by conducting research into enablers and barriers, making recommendations to stakeholders based on results, and to develop case studies of successful projects. This project aims to help Canadian communities learn how to aggregate or bundle their local, low-carbon energy projects to unlock capital from large investors.

QUEST Canada undertook a literature review to gain an understanding of the existing research and practice relevant to the financing of local low-carbon energy projects. This narrative report summarizes the material reviewed, presents the knowledge gained, and provides a high-level financing architecture for local energy initiatives.

ASSESSMENT

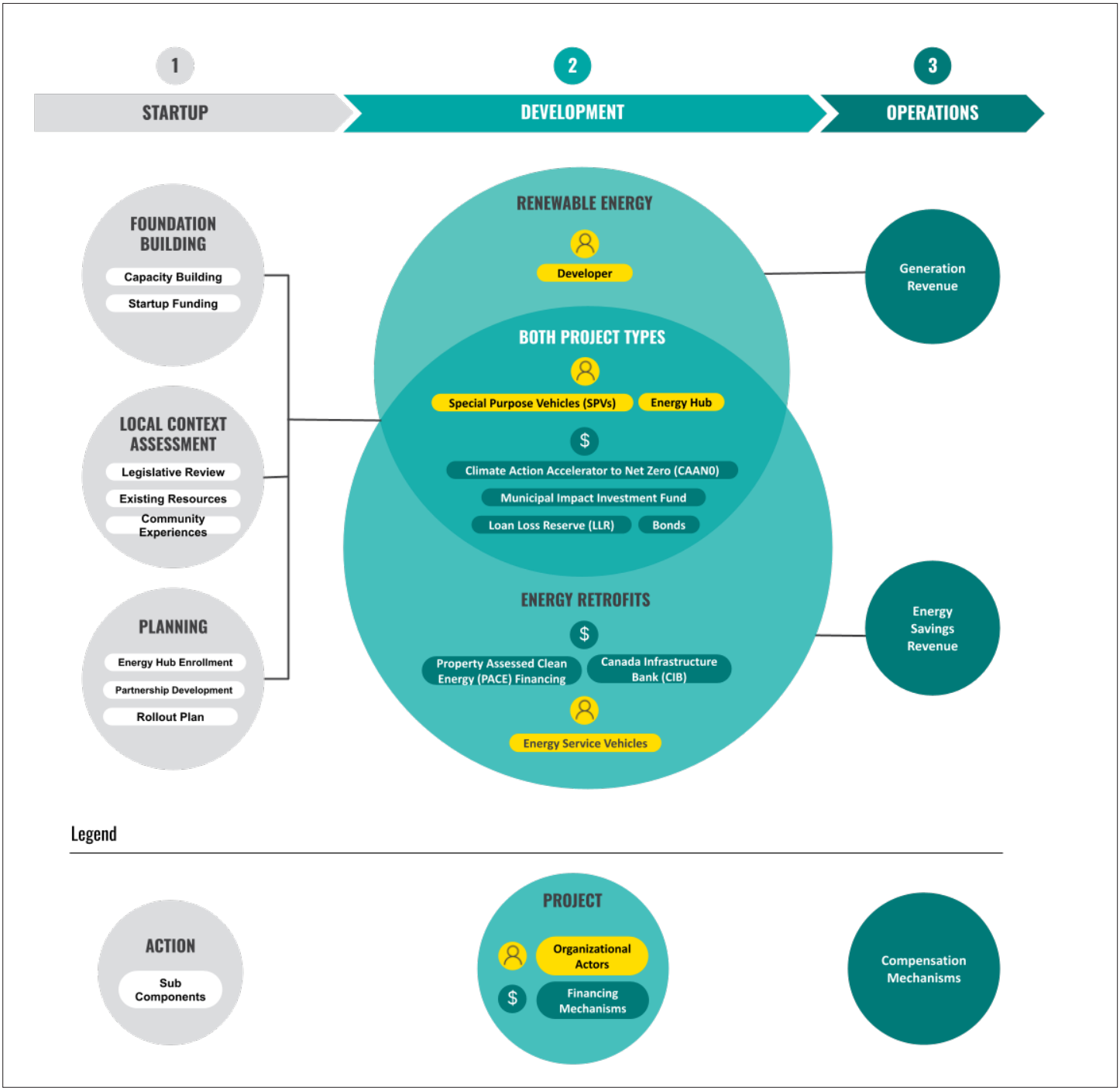
QUEST Canada assessed the tools explored in the literature review through the following three lenses:

- **Financial Scalability:** Ability to raise capital and aggregate low-carbon projects.
- **Applicability:** Alignment with existing legislation and/or senior government agendas and/or existing and developing mechanisms.
- **Social Benefit:** Ability to support energy democracy and reconcile settler and Indigenous relations.

FINANCING ARCHITECTURE

Based on the analysis of the research, a high-level financing architecture was developed and is described below. The architecture is subject to further refinement upon a stakeholder engagement exercise.

Figure 1: Financing Architecture



The financing architecture outlined in the Figure above focuses on two broad project types and are project agnostic:

1. **Renewable Energy:** Including, but not limited to, district heat, community scale wind and solar.
2. **Energy Retrofits:** Including, but not limited to, demand side management (DSM) and deep industrial, residential, and commercial retrofits (envelope tightening, heat source swaps, etc.).

Enablers and associated processes and mechanisms, identified in the Legend, are categorized under three broad phases of project progress:

3. **Startup**
4. **Development**
5. **Operations**

STARTUP PHASE

Existing clean energy financing structures do not address the local context, nor support foundation building and planning at the community level. It is recommended that during the startup phase the foundation for a community-led low-carbon energy transition is developed via three startup actions and multiple sub-actions listed below. Understanding that communities have unique barriers and opportunities, the startup phase will differ from community to community, but should all begin by enrolling in an Energy Hub for reasons described below:

Figure 2: Startup Phase and Actions

FOUNDATION BUILDING

Communities with sufficient capacity and funding have demonstrated that existing financing mechanisms enable clean energy projects. However, despite the existence of financing mechanisms and some Canadian successes utilizing said mechanisms, a lack of capacity and funding at the community level have prevented eligible communities from participating.

- Capacity Building: Builds capacity for all three project phases. Enrollment in an Energy Hub (see Planning sub phase) will assist with this activity.
- Startup Funding: Secure seed funding to execute Startup activities. Enrollment in the Energy Hub (see Planning sub phase) will assist with this activity.

LOCAL CONTEXT ASSESSMENT

The successful application of existing finance mechanisms requires a comprehensive understanding of the local context. What is legally permitted differs from jurisdiction to jurisdiction and these nuances need to be fully understood before designing and implementing a Rollout Plan (See Planning Phase). Success also appears to occur with communities with

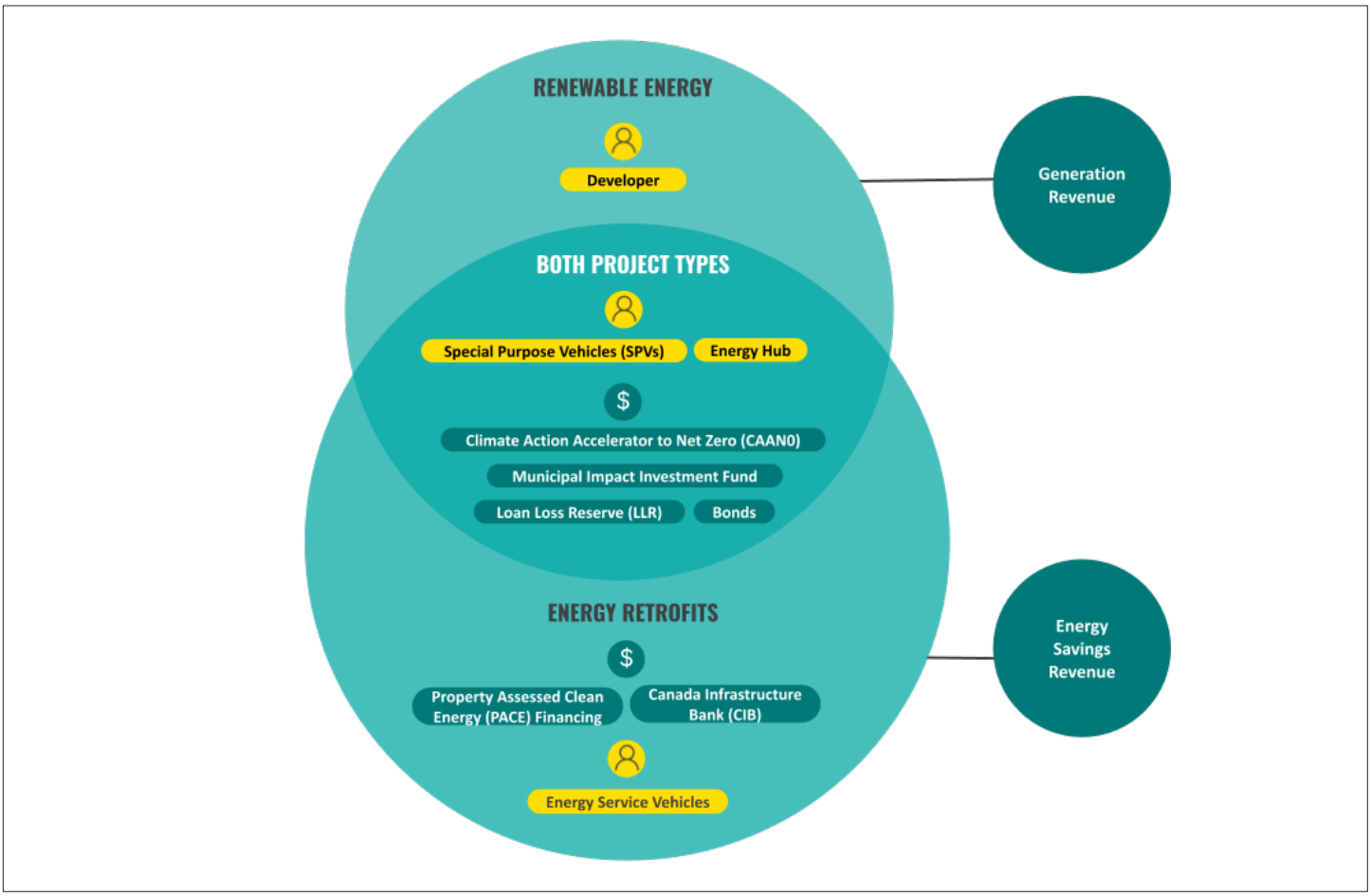
existing energy-related programs. To complement this, understanding lived experiences of community members will ensure that sufficient community resources are allocated to prioritize opportunities, while allowing for a clean energy plan that considers and addresses said opportunities.

- **Legislative Review:** Scan legislative barriers and/or opportunities. This includes but is not limited to: Partnership, grid, debt, and equity restrictions.
- **Community Experiences:** A comprehensive scan of community experiences, which includes understanding the lived experiences of historically marginalized community members. This will ensure the energy plan addresses community inequalities.
- **Existing Resources:** Leverage existing community initiatives to avoid redundancy and

DEVELOPMENT PHASE

Existing clean energy financing structures do not adequately aggregate projects. A streamlined process to stack investments and pool community projects while de-risking investments to strengthen uptick and decrease risk is needed. The development phase executes the community energy transition plan for both energy retrofit and renewable energy project types. In this phase organizational actors and financing mechanisms established in the startup phase are operational.

Figure 3: Development Phase with Organizational Actors and Financing Mechanisms



ORGANIZATIONAL ACTORS

Literature research, supported by apropos interviews with subject experts, suggests that existing, evolving and/or foreign capitalization strategies should be supported by the following Organization Actors. Startup phase activities will add resolution and/or modify the structures generalized below:

- Developer (Renewable Energy Specific): In addition to being an organizational actor, the developer may also play a crucial role in financing the renewable energy projects.
- Energy Service Vehicles (Retrofit Specific): Manages financial stacking for deep energy retrofits in industrial, residential, and commercial sectors. Stacking consists of, but is not limited to, the mechanisms described in the following section (Financial Mechanisms). Energy Service Companies (ESCO) are an example of an Energy Service Vehicle.
- Special Purpose Vehicles (SPVs): Legal entities established to fulfill a specific objective – generally to separate an asset, subsidiary, or financial transaction from a larger government agency by keeping it off the agency's balance sheet. The vehicle may also be used to circumvent other legislative barriers.
- Energy Hub: A centralized supporting hub, with local chapters, which guide communities through their capitalization strategy.

FINANCING MECHANISMS

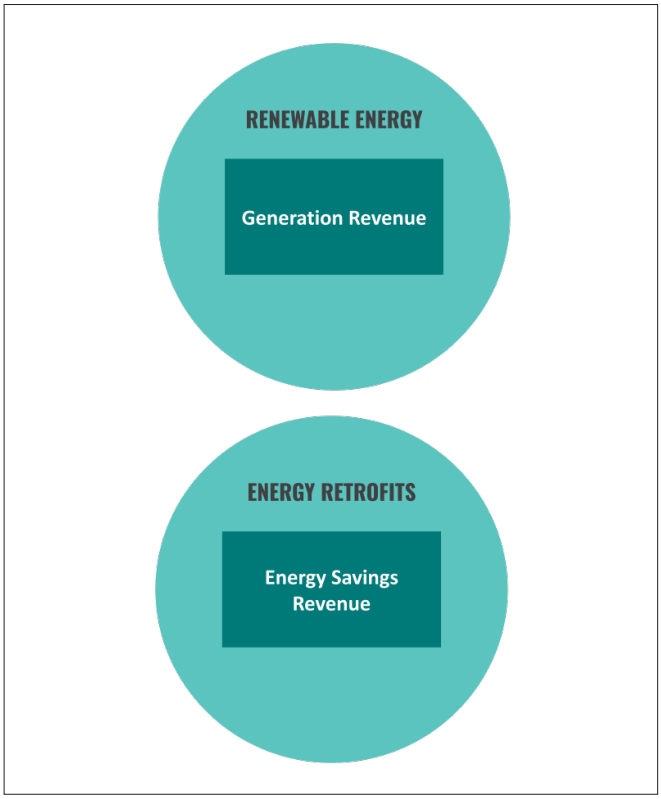
Innovative financing mechanisms are being applied and conceived across Canada. The ones described below support financial scalability, are applicable to most jurisdictions, and have the potential to allow for social benefits.

- Property Assessed Clean Energy Financing (PACE): Financing for property owners secured via a lien on the property.
- Canada Infrastructure Bank (CIB): Acts as a project aggregator for community-scale retrofits.
- Loan Loss Reserve: Acts as a backstop to mitigate project risk, thus attracting investors.
- Bonds: Debt financing with a focus on local investments to support a circular economy, and inclusive ownership to empowering underrepresented community members.
- Climate Action Accelerator to Net Zero (CAAN0): Acts as a revolving energy fund (REF) to secure private investments in project equity and blends project returns to reduce risk thus attracting investors.
- Municipal Impact Investment Fund (MIIF): A 'fund' that provides building project retrofit capacity support. MIIF is in its pilot phase with Barrie, ON and Victoria, BC.

OPERATIONS PHASE

During this phase there exists a streamlined and barrier-free process to generate project revenue, track success, and disburse returns. Indicators of success, such as revenue generating streams will differ from community to community and are generalized below:

Figure 4: Operations Phase with Revenue Streams



- **Generation Revenue:** Power Purchase Agreement (PPA), Feed-in-tariff (FIT), Renewable to Retail (R2R), etc. to be determined at Startup, based on local context assessment.
- **Energy Savings Revenue:** Net Metering, utility billing, etc. to be determined at Startup phase, based on local context assessment.

CONCLUSION

A broad scan of the clean energy financing landscape has confirmed:

1. **Substantial barriers (Municipal Government Acts, Electricity Acts, community circumstances, etc.) prevent a cookie-cutter pathway to clean energy financing for communities to materialize.**
2. **Supporting structures are needed to streamline investments in clean energy at the community level and to add resolution to a generalized capitalization architecture.**
3. **Existing clean energy financing structures do not adequately aggregate projects. A streamlined process to stack investments and pool community projects while de-risking investments to strengthen uptick and decrease risk is needed.**
4. **Existing clean energy financing structures do not adequately support the principles of energy democracy.**
5. **Existing clean energy financing structures do not adequately address Indigenous and settler relations. A co-developed framework that prioritizes relationship building is essential.**

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