

**PURSuing SUSTAINABLE ENERGY DEVELOPMENT VIA COMMUNITY
ENGAGEMENT IN CROSS SECTOR SUSTAINABLE PARTNERSHIPS-**

A CASE STUDY

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ABSTRACT

There now exists extensive literature on how community-led cross sector strategic partnerships can make meaningful contributions towards sustainable energy development. However there exist many gaps, identified through a literature review, around community involvement in energy partnerships in North America, Canada and specifically Southern Alberta in available research. Through an intensive case study of a community led sustainable energy project in Southern Alberta, this study aims to address this gap in literature and build theory for actionable policy directives by government and future renewable energy partnership stakeholders in the region.

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CHAPTER 1: INTRODUCTION

1.1 PROBLEM FRAMING

It is now becoming increasingly obvious that a change in the ways in which energy is produced and consumed globally is necessary and urgent (Dijkstra, Westerman, & Harris, 2011; Lindsey & Dahlman, 2021). However, the traditional, linear, and often insular ways in which societies and governments have acted may be unsuitable to dealing with the challenges of climate change, increased urbanization and ensuring energy security. In fact, some researchers are calling for efforts to re-examine managerial epistemology as a whole in favor of critical epistemology since the current (largely neoliberal) managerial approach “may slow the velocity with which we’re headed towards a system collapse but will not change the trajectory of that inevitability” (Ergene, Bannerjee, & Hoffman, 2020, p. 5). There is now mounting evidence that no single stakeholder- business, society, or the government- can handle these challenges successfully or indefinitely without collaboration on a sustained scale (Kaye, 2013; Selsky & Parker, 2005; Waddock & Smith, 2000).

Waddock (1991) characterized cross sector strategic partnerships (CSSPs) as: “the voluntary collaborative efforts of actors from organizations in two or more economic sectors in a forum in which they collaboratively attempt to solve a problem or issue of mutual concern that is identified with a public policy agenda item” (p. 481-482). A key concept in the analysis of cross sector strategic partnerships (CSSPs) is the framing of sustainable development as a “wicked” problem and the consequent implications for public and private actors (Clarke & Fuller, 2010; Dentoni, Bitzer, & Pascucci, 2016; Wuelser & Pohl, 2016). Wicked problems are understood to be multi-faceted, complex, and far-reaching in both their makeup and consequences. They are

often connected to other wicked problems and do not lend themselves to simple definition or easy, short term solutions. As the concept applies to the case of sustainability, problems often end up being of “high scale, broad scope, serious threat, varying urgency and possible irreversibility” which is another reason why dealing with questions of sustainable development may often require a collaborative interdisciplinary or multidisciplinary approach (Murphy, 2012).

Given the importance of collaboration, and the increasing need to re-define traditional or largely economic markers of the accomplishments of said collaborations, a question I feel compelled to investigate is how “success” for sustainable energy projects can be framed in ways that look beyond profit, and the extent to which partnerships and specifically, community involvement can be an effective way to achieve said success. This broader understanding of success may include outcomes such as effective and meaningful stakeholder engagement, addressing market and governance failures, or larger public policy objectives beyond just minimizing the levelized cost of electricity (LCOE). Additionally, when different stakeholders with a variety of expertise, perspectives and priorities come together, I am eager to explore the extent to which such pooling of resources lends itself to synergy which can address aspects of the problems at hand that none could independently handle. This would consequently call for conceptual or theory building research, focused on paradigmatic transformation and not just an extension of existing theory, but instead an expansion or broadening.

To that end, this study seeks to explore the various factors that can better enable CSSPs in renewable energy to become scalable, replicable and adhere to a broader definition of success than just lower costs and better economic returns, leading to the development of actionable policy recommendations. Through the in-depth exploration of a project initially designed as a community

led CSSP, via a case study method, this study aims to expand existing theoretical frameworks around community involvement in CSSPs as a measure and path to broader success.

1.2 RESEARCH QUESTIONS

My approach in this study to investigate and review the role of community partnerships in CSSPs in energy will be an exploratory single-case study, based on a solar project in Southern Alberta called the Renfrew Community Solar Garden. The case will focus on identifying the values of the community especially with respect to attitudes towards renewable energy and the ways in which those values and attitudes determine and impact project outcomes.

My research questions for this study are:

1. To what extent do findings and learnings from literature on community partnerships in sustainable energy projects in other parts of the world apply to projects in Southern Alberta?
2. How can attitudes and values within the community impact community partnerships in sustainable energy projects?
3. How do lessons and insights from this case study contribute to theory building about community partnerships in sustainable energy projects?

CHAPTER 2: LITERATURE REVIEW

2.1 WHY PARTNER?

Before presenting a list of reasons supporting and elaborating on particular types of partnerships, I feel it is necessary and relevant to examine the broader reasons for why cross sector strategic partnerships of any kind, in any field and geographical region, have gripped the collective imagination of practitioners and theoretical specialists alike.

2.1.1 SYNERGY

One of the most compelling reasons to pursue CSSPs in addressing complex and evolving issues such as sustainable energy development, is to understand how each actor can play a unique role, from a different angle, in crafting the “solution.”

Governments and other multilateral players can in turn set targets, devise frameworks, and implement mandates to change behaviors and utilize resources, effectively keeping each other in check. An example of this process in action is the German Renewable Energy Resources Act (EEG), a feed-in tariff scheme that incentivizes businesses and utilities while promoting renewable and sustainable energy via policy and legislation (Kim, 2020). When the EEG was first introduced in 2000, renewable energy sources contributed only 6% to Germany’s energy mix. The Act aimed to prioritize the integration of technologies like wind and solar into the market, supported by fixed tariffs and a purchase guarantee. This evolved over the years, as the market developed, to a competitive market-based auction instead of fixed tariffs in 2017. In 2021, when the latest updates to the EEG were made, renewables made up 50% of the German energy mix. Additionally, the EEG also helped reduce the once-rapid increase of electricity prices in Germany, as well as helping achieve the UN and EU climate protocols that Germany is a signatory of (Appunn, 2021). It is

worth noting that while the Act certainly created an enabling environment and set the stage for renewable sources to thrive in the energy market, the enthusiastic uptake by industry, consumers and regulators as stakeholders is a key part of the initiative's success. I find it useful to mention this here since my interest in partnerships within the sustainable energy space spans continents, influenced and informed in particular by each of the places I have lived in- Germany among them. Studying European and German policy initiatives, their influence on the European outlook and progress towards greener energy and being able to compare that with attitudes and policy elsewhere is thus of particular interest to me.

Non-profit and donor agencies can also play an important part in the process by informing the dialogue on the most pressing concerns and maintaining pressure on key agenda items, as well as pushing for transparency (Bisaga, Parikh, Tomei, & To, 2020). This also includes civil society actors, citizen groups and voluntary organizations motivated by a variety of social interests that can help broaden the lens for partnership outcomes.

The role of the private sector in pushing the sustainability agenda forward cannot be emphasized enough. Initiatives like RE100, a commitment by almost 250 of the most influential global businesses to become 100% renewable, or Ecomagination, are a key step in the process (General Electric, 2015). Arguably one of GE's most successful business initiatives of all time, Ecomagination has resulted in GE doubling its investments towards clean energy and cleaner technology like water purification and lower emission aircraft engines over 10 years (2005-15). Through partnerships with other global businesses like Total, Intel and others, the initiative has been able to create wide-ranging impact from constructing wind farms in India to reducing GHG emissions from Canadian oil sands (Haldemann, 2016). It is, however, worth considering whether investing time and resources in "old world" fuels is wise or necessary, just because the world is

still dependent on them, or whether resources are best spent focusing only on clean fuels or towards the energy transition.

Regardless, given the resources, including technology and human capital, that businesses have access to and can generate, prominent private sector representation in creating a more sustainable world is indispensable. It is also important to note that the private sector is in fact the leading pollutant in many parts of the world. Industries like Oil and Gas, construction and airlines are responsible for over half of global emissions annually (Lindsey & Dahlman, 2021) and demands for businesses to do their part in addressing the problem they helped create continue to grow (Business Wire, 2021).

Thus, various stakeholders bring particular sets of considerations, resources, and outlook to the partnership setting. Whether driven by public policy, citizen action or the bottom line, partnerships that bring together representatives with influence in diverse areas appear to be a promising formula to create impact. Of course, the evidence that overall, partnerships by design are set up for success is accompanied by the caveat of, where applicable, political will, transparent use of funds and accountability to name a few (Oyedele, 2012).

2.1.2 DIVERSIFICATION LEADING TO RESILIENCE

Not only do the CSSPs identify common goals and pool resources to accomplish more than one stakeholder could do together, but they could also address important market failures and governance gaps. These can range from targeting the improved provision of social good such as health or education or attempting to solve problems that may be economic, social or environmental to name a few (Kolk & Lenfant, 2015). This becomes even more apparent when the role of CSSPs in improving de-centralized energy access and delivery in emerging markets is examined. Existing structural weaknesses- ranging from generation to transmission inadequacies- mean that

partnerships have the opportunity to serve markets in a new way entirely. The dramatic uptake of mobile phones and technologies like portable solar lights, household biogas units and others in the last few decades demonstrates the possibilities of decentralization as an alternative to national grid systems (Glemarec, 2012). Using private or international finance, state will and/or machinery, and designing for domestic conditions can create resilient models, which are flexible to change, which can be another significant advantage for CSSPs.

The variety of governance, funding, and leadership styles available to CSSPs means that, when correctly utilized, they can be incredibly resilient and effective models for getting the job done (Van Hille, Baker, Ferguson, & Groenewegen, 2020).

CSSPs have particular benefits for renewable energy. They focus largely on decentralized, renewable and hybrid models when traditional grid solutions are either prohibitively expensive or unsuitable because of geographic factors like terrain. Centralized energy systems are ill-equipped to deal with the risks of climate change and potential energy insecurity. They cannot accommodate multiple technologies, like de-centralized energy systems can. Effectively, a decentralized network can transform national grids from mere one-way energy highways to smart grids harnessing the power of pocket communities (Allen, Sheate, & Diaz-Chavez, 2012). All these factors add flexibility and reliability to the resulting energy systems, which create and nurture resilience.

2.1.3 VALUE CREATION

In many cases, CSSPs focusing on renewable energy provision connect private sector companies, often having significant transnational operations and significant resources, with local partners which enables investment power to be combined with local or community knowledge (Allen, Sheate, & Diaz-Chavez, 2012). This helps leverage the core competencies and experiences of each partner for a more robust on-ground solution. Energy transformation is a strategic

challenge with diverse stakeholders, from governments to utilities to citizens, and each has their own role to play if the challenge is to be overcome.

Utilities, for instance, may also need to seek partners that enable the ownership of renewable energy resources and develop from commodity providers to energy service providers (Richter, 2012). This includes exploring possibilities such as investing in energy efficiency, smart grids, demand side management and the ultimate provision of renewable energy systems. Thus, there is potential value to be created in all aspects of the energy value chain and partnerships are often well equipped to deal with these challenges of energy transformation, decentralization, and restructuring. As partnerships increase risk sharing and ownership, so do they encourage innovation, if the requisite consistent energy policy frameworks are in place.

2.1.4 ENERGY PROVISION DRIVES GLOBAL DEVELOPMENT

Reliable energy provision has long been an enabler of development (Bisaga, Parikh, Tomei, & To, 2020; Hanwha Group, 2019). CSSPs in emerging markets have traditionally been known to prioritize innovative methods of service delivery and can lead to consolidation of the available tangible and non-tangible resources in doing so. In a study examining the progress of off-grid solar energy projects in Rwanda and the ways in which electrification was contributing to achieving UN's Sustainable Development Goals, Bisaga et al. (2020) found that up to 47% of Rwanda's SDG targets had identifiable and documented synergies with sustainable energy deployment. This meant that by prioritizing sustainable energy projects, which in Rwanda were being spearheaded through the *imihigo* framework which allowed for cross-sectoral collaboration between national, state and local ministries as well as the private sector and international donors, Rwanda was able to advance on nearly half of its overall SDG targets indirectly. Access to safe, reliable, and

affordable electricity helped achieve development targets in sectors as diverse as water, health, education, poverty alleviation and health among others (Bisaga, Parikh, Tomei, & To, 2020).

Additionally, partnerships between renewable energy providers, telecom and ICT companies and local NGOs can serve to not only electrify communities but also leverage tech-based competencies. These could be used for paying bills and building energy infrastructure like metering to provide comprehensive off-grid solutions (Gaggl, Schellekens, & Gentili, 2014).

2.1.5 RESEARCH IMPLICATIONS

These ideas feed into to a broad range of implications for the understanding of sustainable development and the role of partnerships within it. These implications include a proposed redesign of the traditional understanding of strategic management, dynamic capabilities, and stakeholder theory to incorporate non-economic outcomes and non-traditional key issues. Another reason why much of sustainability research increasingly advocates for a transdisciplinary and interdisciplinary approach is to reduce the emphasis on theories stemming predominantly from economics and social sciences (Wasieleski, Waddock, Fort, & Guimaraes-Costa, 2021). Arguably, policy frameworks stemming from neoliberal economics-backed reasoning, ideas such as the now infamous “trickle-down economics”, can be said to be largely responsible for a consumerism driven world order we find ourselves in today. This has contributed in multiple ways to resource utilization outpacing resource development or generation, creating an unsustainable carbon footprint that seems to only get larger (Banerjee, 2003). One promising research implication that stands out to me is also Teegen and Doh’s (2003) framework of enablers (“stake givers”) and obstructors (“stake takers”) especially within partnerships with business and government partners (Doh & Teegen, 2003). Power asymmetries within social partnerships especially have been identified as an important but under-researched area by multiple researchers, however that has yet

to significantly alter the fore-mentioned neo-liberal lens through which processes and outcomes are still viewed (Selsky & Parker, 2005).

2.2 THE ROLE OF COMMUNITY IN SUSTAINABLE ENERGY

PARTNERSHIPS

2.2.1 WHAT IS COMMUNITY ENERGY?

The term “community energy” has a variety of readings that are dependent on both context and interpretation. *The Guide to Developing A Community Renewable Energy Project In North America* acknowledges community energy projects as those which can claim a community participation component “...that reaches beyond a simple investing and shareholding relation,” (Commission For Environmental Cooperation, 2010, p. 1). While consistent support for the community-led or community-driven sustainable energy project has been found in literature, especially in research based in Europe or the UK, clarity on implementation has been slower to follow. (Goedkeep & Devine-Wright, 2016; Terrapon-Pfaff, Dienst, König, & Ortiz, 2014). Case studies such as that based on the Lake District National Park in the UK demonstrate this, where despite public will, government support and availability of funding, lack of existing expertise and data on implementing community energy projects became a significant barrier to project success (Allen, Sheate, & Diaz-Chavez, 2012). There existed significant legislation and government support for decentralized energy access and diversification of the energy mix in the UK since at least the early 2000s, such as the Sustainable Communities Strategy and various other pieces of legislation, but community energy projects were still relatively new and thus the interpretation of existing legislation as applied to them was still work in progress. Additionally, their management structures can also be unconventional. Community energy projects can have split ownership, i.e., where shareholding and asset ownership within the community is featured, or just shared revenue,

where project buy-in means rights to part of a future revenue stream or feature more typical joint venture agreements as well. Community energy initiatives thus can be defined by extent of public participation, proportion of locally generated energy being consumed locally, manner of governance or ownership structure (Hoffman & High-Pippert, 2010).

Particularly in the US, to a large extent the market-based use of the term “community energy” now loosely refers to projects initiated by businesses to earn revenue from the sale of electricity, where community members can buy into the projects as shareholders (John, 2014). However, this capitalist, neo-liberal construct is not consistent with the theory of community energy as a socio-technical innovation. Behavioral change, better decentralized energy systems and other social benefits such as the effective practice of good governance where present and future needs of citizens are heard and addressed, are all much more persuasive reasons for pursuing and prioritizing community energy (Allen, Sheate, & Diaz-Chavez, 2012).

2.2.2 FINDINGS FROM LITERATURE: COMMUNITY ENERGY OUTCOMES

Renewable energy projects with a focus on community involvement and ownership are crucial since they stand to create significant positive spillover over the life of the project which can go beyond financial benefits alone. As reported in case studies such as the Lake District National Park mentioned above and those on community initiatives like Carbon Conversations in the UK, many communities involved with sustainable energy projects report increased social cohesion, a heightened sense of duty and greater willingness to experiment with alternate ways of living and alternate energy systems (Allen, Sheate, & Diaz-Chavez, 2012; Seyfang, Hielscher, Hargreaves, Martiskainen, & Smith, 2014). Carbon Conversations is a 6-session course developed by Cambridge Carbon Footprint, designed to encourage discussion and engagement in low carbon living, as well as address feelings, resistance, and difficulties in altering one’s practices and

attitudes. Through in-depth interviews and focus groups with participants before, during and after the course, researchers found that the community aspect was experienced strongly by participants in the collective experience of delving into one's lifestyle and practices, and in this sense removed the feeling of acting alone creating greater flexibility to change. (Aiken, 2015).

These projects are also crucial in addressing the “value-action” gap: the difference between sustainable attitudes and sustainable behavior (Parag, Hamilton, White, & Hogan, 2013). Learning and skill transfer can be another important result, contributing positively to overall greater community engagement for future projects (Putnam, 1993). As an example, Denmark's transition to become one of the world's leading countries in wind energy adoption, research and generation was catalyzed by a social movement that began with community and energy activists-led experiments with small scale wind turbines in the 1980s and 1990s (Ornetzeder & Rohrer, 2013).

2.2.3 COMMUNITY-LED VS. MARKET-LED CSSPS: REDEFINING SUCCESS

The benefits and outcomes discussed in section 2.2.2 can be even more pronounced for community-led CSSPs, which differ from projects borne of market-based innovations in a few key ways. Seyfang et. al. (2014) draw largely on research based in the UK and comment on how, at least for the UK, the rise in projects with this model follows a broader international trend of localism. They observe that the driving force for community-led initiatives is often social or environmental need, as opposed to rent seeking. These projects find justification in civil society not the market economy (Seyfang, Hielscher, Hargreaves, Martiskainen, & Smith, 2014). Community led energy projects are organized in diverse structures such as cooperatives, voluntary organizations, and other community initiatives- not just firms. More importantly for long term implications, they can also drive behavioral change through establishing trust and social cohesion.

Parag et. al. (2013) acknowledge that communities are “important agents for driving bottom-up social change as they have the potential to create political space and support local government needs in order to introduce energy related policies and programs” (p.1076). The resource base they may draw on can be similarly diverse, beyond just formal loans and commercial income.

Most significantly, and in reinforcement of the work of other researchers cited in this study, is the finding that community-led energy projects are often found to be grounded in local and collective values rather than concerns with efficiency and profit seeking. I think this is significant particularly in the context of where we are in the energy transition (i.e., not there yet). Since global environmental ‘bads’ cannot be disentangled from their local impact, such as the melting arctic ice caps impacting rising sea levels in cities like Venice and Miami, it is, similarly, no longer possible to separate local action from the resolution of global challenges. Thus, grassroots change, driven by collective values, is an intrinsic part of solving the ‘wicked problem’ that climate change presents us with. For community projects then, the principal benefit reported by participants is often symbolic- the shared practicing of green values- instead of tangible economic or monetary impact (Parag, Hamilton, White, & Hogan, 2013; Rhodes, 2000). Furthermore, community based, or initiated energy schemes have the advantage of being small and decentralized. They can engage multiple community actors to maximize social, environmental, and economic outcomes, which empowers consumers and also has also been found to encourage lower energy consumption. An “ideal” community project could then be one with an open and participatory process, and the possibility of both local and collective benefits (Commission For Environmental Cooperation, 2010; Waddock & Smith, 2000).

In their study of six archetypes of local community-private sector renewable energy partnerships, Eitan et al. (2019) quote several such examples. A study of several projects in UK

and Colombia showed that the incidence of NIMBYism (Not In My Back Yard) diminished when communities were directly involved and able to influence outcomes and processes, such as management of noise levels, landscape damage and effect on water sources (Eitan, Herman, Fischhendler, & Rosen, 2019).

2.2.4 BUILDING TRUST: THE ROLE OF OWNERSHIP

As expected, and mentioned in earlier sections of this study, researchers found that among the most important factors determining energy project success in many cases featuring high community involvement is being able to build trust between participants and avoid conflicts of interest (Goedkeep & Devine-Wright, 2016). Perceived energy justice, both procedural and distributional, is also key to the establishment and longevity of that trust. While overarching factors like policy frameworks, norms and institutions certainly play a role, it is often the unique features in each project's environment that determine how different views come together in shared ownership arrangements between communities and developers in practice for eventual success, or lack thereof (Stirling, 2008).

Terrapon-Pfaff et. al. (2014) find that regardless of the project size, trust and reliability between implementing organizations and stakeholders, as well as a sense of ownership among beneficiaries where community involvement exists, is crucial to project's longevity and sustainability. This study based its conclusions on projects in different emerging economies from Latin America, Sub Saharan Africa, and parts of Asia. Solar, wind, and hydro projects were all part of the sample and consistently, across continents, the study found that a sense of ownership, user satisfaction, the ability of the project to be run and managed using local knowledge and skillset within the community were significantly impacted by trust between partners. Trust was built through effective consultations and engagement with the community from project onset, setting

up a self-enforcing positive loop. Examples of unsustainable projects in the study, such as unsuccessful attempts to power irrigation pumps in Nigeria through renewable sources rather than kerosene, ultimately failed due to the lack of community ownership, trust and buy-in. Interestingly enough, the authors note that projects with the best chance of building trust with the community are those where most of the partners are local and embedded within the local context (such as local businesses, municipalities, NPOs or other community organizations) rather than those where despite the abundance of technical or financial resources, partners are foreign to the country or region (Terrapon-Pfaff, Dienst, König, & Ortiz, 2014). In an entirely different context, Eitan et. al. (2019) quotes that trust is crucial to project longevity within community partnerships in rich, Western communities in Europe and North America as well. The study cites the example of the community on the British Isle of Wight, which owns the Wight Community Energy Company (Eitan, Herman, Fischhendler, & Rosen, 2019). Powering more than 1300 homes, this project relies on solar generation and community members act as shareholders. The private company, Anesco, which was the project partner for construction development and operations, is a local company and thus project representatives reported high levels of trust in the partnership and a relatively equal distribution of power.

Putnam (1993) highlights how trust is also self-reinforcing; once established, it promotes cooperation which then generates higher trust levels in a positive feedback loop; while the converse is equally true in cases where community objections or feedback may be ignored or taken lightly.

2.2.5 WHY COMMUNICATION MATTERS

Another significant success factor reinforced by research findings is the importance of communication. Stirling (2008) draws on findings from a broader public participation context to

comment on how partners, usually corporate or state-led developers, typically wish to engage communities in one-way communication and at later stages of project development even though evidence suggests that two-way communication and early engagement are more effective in managing dissent and generating project buy-in (Stirling, 2008). When developers can provide opportunities for communities to play an active role in negotiations early on and draw on companies and experts from the area, these efforts also go some way in building relationships within the community and improve the likelihood of favorable outcomes (Allen, Sheate, & Diaz-Chavez, 2012). Examples from studies quoted in the previous sections show then, that trust and communication, which together help generate consensus which leads to project ownership and entrenchment within the community is then, not dependent on type of community- rural or urban- or community wealth, or even geographical location. Examples of studies from North America to Asia show that this is not just good practice, but good business. Consensus building is essential for communities, businesses, and authorities to be able to work together and make meaningful progress on implementing sustainable energy agendas.

2.3 GAPS NECESSITATING RESEARCH QUESTION

2.3.1 A MORE CRITICAL PERSPECTIVE ON PARTNERSHIP

PERFORMANCE

In the review of partnership literature as presented in the previous sections, there appears a rather one sided, positive view of partnerships as an approach, which I find difficult to justify entirely given the mixed track record of partnerships globally (Clarke & Fuller, 2010; Eitan, Herman, Fischhendler, & Rosen, 2019; Gaggl, Schellekens, & Gentili, 2014). In their book titled ‘Public-Private Partnerships for Sustainable Development- Emergence, Influence and Legitimacy’ Patterberg et. al. use statistical analyses of data from the Global Sustainability Partnership

Database (GSPD) and quote a significant number of partnerships which show limited effectiveness, if at all (Patterberg, Biermann, Chan, & Mert, 2012). It is fascinating to discover, for example, that in a given 10 year stretch (2000-10), a mere 15 % of partnerships in the examined indicated a budget plan, 23 % have office space, 30 % seem to have staff members, and just 5 % disclose a memorandum of understanding (Patterberg, Biermann, Chan, & Mert, 2012, pp. 257-258). The same source shows that only around 25% of partnerships report all the partnership outcome fully matches publicly stated goals and ambitions. This is in addition to the already narrow definition of success for partnerships I highlight in the previous section- marginalization of key stakeholders, power dynamics, lack of trust are all factors discussed in this thesis that are not quoted in the above study. It would appear almost as if researchers were unable or unwilling to acknowledge or analyze partnerships that fall outside of the theoretical frameworks designed or created by scientists FOR studying partnerships (Patterberg & Widerberg, 2016).

Suboptimal performance by or because of a partnership in sustainable energy can be attributed to a host of reasons. Theoretical bases exist for partnerships going sour as a result of distrust or conflicts of interest, omitting powerful or important stakeholders, inappropriate leadership styles, or bad communication among other factors (Denhardt & Aristigueta, 2011; Dickinson & Sullivan, 2014; Guarneros-Meza, Downe, & Martin, 2017). Despite the theoretical grounding, the literature tends to fall short in elaborating equally on the practical examples of shortcomings in and around partnerships as compared to the examples that exist as justification for championing partnerships (Patterberg & Widerberg, 2016). There is also a lack of data on potential project opportunities and public sector failures (Allen, Sheate, & Diaz-Chavez, 2012). There are some notable exceptions, such as some of Bobby Banerjee's work, which also draws attention to multiple vested interests to go some way in explaining this state of affairs (Banerjee, 2003;

Banerjee, 2008). However, much of the literature seems to be skewed towards building optimism towards partnerships at the expense of developing a more balanced picture.

2.3.2 THE NEED FOR A BROADER VIEW OF CONDITIONS FOR SUCCESS

I also found that some researchers tend to underplay the importance of local communities, local conditions and local capacity building in the ultimate success or failure of renewable energy partnerships (Wuelser & Pohl, 2016). Patterberg and Widerberg (2016) propose a few conditions for success to evaluate partnerships and determine which ones are worth creating or pursuing. However, these conditions attribute most of a partnership's success to meta-governance, institutions, and processes- with only a secondary focus on local factors like technical knowledge, funding and other critical factors like project champions, experts, and the resilience of communities to build something they believe in.

The majority of research about community-led energy projects has a European or UK-centric focus, and most of the barriers to success quoted therein are also in the realm of institutional and financial shortcomings (Klein & Coffey, 2016). Similar to Patterberg and Widerberg (2016)'s view of partnership success, research on community led energy in the UK only tangentially identifies local context or factors like low community buy-in, or ownership in cases where there wasn't outright organized NIMBYism or protest. Corporate partners also tend to pay most attention to the source or availability of funding and/or technical expertise, which is only rarely local (Patterberg & Widerberg, 2016). However, local context- in particular, socio-political context- is just as important if not more important than other resources (Banerjee, 2003).

2.3.3 FOCUSING ON NORTH AMERICA

Intensive analyses beyond theory and when focused on case studies or narrative research led studies of actual projects often reveal that conditions on ground have a disproportionately large

impact (Walker, 2008). As an example, Klein and Coffey (2016) highlight how in the US, behavior interventions targeting energy transition disproportionately focus on individual choices- methodological individualism, as if we were all operating in isolation. However, evidence shows that energy behaviors are more likely to be grounded in social or group decision making closer to home, leading to conclusions around the need to develop a greater understanding of the role of social interactions and power relations in the grounded performance of practices. This evidence was observed across research on energy behavior change initiatives in workplaces (Hargreaves, 2011), experiments in the graduate classrooms across major US universities and even how consumption patterns evolve collectively not individually (Schot & Geels, 2008). Thus, there exist compelling evidence-based cases for prioritizing community involvement in energy infrastructure transformation (Allen, Sheate, & Diaz-Chavez, 2012; Klein & Coffey, 2016; Rogers, Simmons, Convery, & Andrew Weatherall, 2008).

Intuitively, this also seems to be something that would play a role in the Southern Alberta context. For instance, I am interested in exploring whether a traditional alignment with Oil & Gas in local Albertan communities and economy is a factor in outcomes in community energy projects. What is the evidence on projects being shaped by community attitudes- and vice versa?

Further, to what extent, if at all, can existing research findings about community led renewable projects, overwhelmingly from Europe and UK, be generalized to Southern Alberta as well, given the potential differences in political and social attitudes? In a world where it is becoming increasingly difficult to look away from the havoc created by traditional fossil fuel sources, how are Southern Alberta's energy choices shaped? Moreover, by exploring the ways in which community engagement is understood and approached, attitudes develop and ideas of trust and justice manifest, can we help create a blueprint for more actively engaged communities to lead

the energy transformation process towards more sustainable outcomes in Southern Alberta? An appropriate mix of resources, knowledge, and capabilities (tangible and intangible inputs) is crucial. All partnerships are not created equal (Rogers, Simmons, Convery, & Andrew Weatherall, 2008)

CHAPTER 3: METHODOLOGY

I begin this section by reviewing and contextualizing my research questions in light of the literature review discussed in the last section. Then I move to describing the research methods and data gathering, analysis and some limitations of the methodology.

My research questions for this study are:

1. To what extent do findings and learnings from literature on community partnerships in sustainable energy projects in other parts of the world apply to projects in Southern Alberta?
2. How can attitudes and values within the community impact community partnerships in sustainable energy projects?
3. How do lessons and insights from this case study contribute to theory building about community partnerships in sustainable energy projects?

These questions, and the study that attempts to investigate them, are designed to address the gaps in literature on community partnerships in renewable energy identified in the previous section. I hope that the first question can bridge gaps discovered in community literature pertaining to North America and Southern Alberta in particular- a landscape where community involvement in renewable energy is still only in its nascent stages. The second question is designed to help address the characteristics of communities where such partnerships emerge, an area where literature does not offer sufficient insight on community attributes like political attitudes, levels of engagement etc. in the context of project success. Finally, the last research question is designed to garner objective actionable policy findings for policy makers, practitioners and communities looking to enter the community generation space, based on the observations and lessons learnt from this case.

3.1 DESCRIPTION OF THE CHOSEN RESEARCH METHOD

In my review of the literature on CSSPs in renewable energy, both qualitative and quantitative methods were utilized, but there is a general leaning towards qualitative case study and grounded theory approaches (Allen, Sheate, & Diaz-Chavez, 2012; Bisaga, Parikh, Tomei, & To, 2020; Eitan, Herman, Fischhendler, & Rosen, 2019). This makes sense given the evolving nature of the discourse. It is also reflective of a need to expand the conventional management and economics' theory-laden understanding of partnerships to better incorporate concerns like adequate stakeholder representation, community involvement and long-term social growth that are beyond merely bottom line analysis.

Creswell (2017) defines the case study as “a qualitative approach in which the investigator explores a real life, contemporary bounded system (a case) over time, through detailed, in-depth data collection involving multiple sources of information and reports a case description and case themes” (p. 97). Case studies are also unique in how they simultaneously explore the subject of interest as well as contextualize it, allowing for researchers to explore the complex interplay especially in situations where the boundaries between the subject and context are not inherently clear (Ridder, Hoon, & McCandless, 2009). Case analysis is also flexible enough to allow for an interaction with causal complexities in comparison with variable oriented analysis (Barr, 2004).

Case study methods are thus an effective research design for exploring partnerships and the role of various key stakeholders within those settings, for multiple reasons supported by findings from literature above and throughout this section. One can simplify the major goals of a case study research to one of either providing description, testing theory, or building and generating theory (Barr, 2004; Yin, 2003). Furthermore, scholars agree that in instances where research objectives involve building theory or elaborating on existing theory, examining violations

of existing theories or understanding differences between expectations and actual outcomes in a variety of situations, case study methods are appropriate and highly valuable (Barr, 2004; Stake, 2005). Especially in situations where constructs and linkages are not well developed, explicit hypotheses are not possible due to lack of clarity or understanding of existing theory, case studies are often the method of choice to advance the field (Ridder, Hoon, & McCandless, 2009). Eckstein (2000) also argues that the most valuable application of the case study method is at the theory building stage of research.

There are several good reasons why case study approach is the method of choice for this study given the identified gaps in literature on the role of community involvement and partnerships, in contributing to the success or failure of CSSPs in Southern Alberta. Since this study aims to address some of those gaps by developing actionable policy findings and building theory, it includes many of the features for which a case study approach is deemed appropriate. Hence, given the suitability and versatility of the case study method it is my approach of choice for this research. I discuss my detailed classification of this study as a case and the implications of this choice for my research findings and research contributions in the following section.

3.2 RESEARCH CLASSIFICATION AND IMPLICATIONS: INTENSIVE CASE STUDY

For this research I use an intensive case study approach, which helps researchers approach the study and study the case's challenges from the perspective of those "on the inside" (Krusenvik, 2016). An intensive case study also allows the case, rather than a specific theory, to become the central aspect of the research, allowing for a "thick, holistic and contextualized description" as theory and data interact (Zikmund, 2000, pp. 98-99). Additionally, given the exploratory nature of my research, using a case study method allows me to take a descriptive and narrative approach to

discuss events in the project's life cycle in order to facilitate the in-depth study of real-life situations as they develop. I incorporate multiple perspectives in my research, garnered primarily through interviews with representatives from the community, government, business partners and consultants working on the project in a corporate capacity. A case study approach allows me to do that well and also, using that information, to formulate and build theory in order to make a larger contribution to literature on community engagement for future renewable energy projects in Southern Alberta.

I classify my research as exploratory based on Creswell's outlining of exploratory research as that which serves the purposes of diagnosing a situation, screening alternatives and leading to the discovery of new ideas (Creswell, 2017). This study makes contributions to all three of these purposes by diagnosing the extent to which findings from existing literature on the topic (mostly from EU and UK) may apply to a project in Southern Alberta, the attitudes, and values of those who engage with the Renfrew project and the discovery of strategies and policies to increase likelihoods of success for such partnership-based projects in Southern Alberta going forward.

3.3 DATA COLLECTION AND SAMPLING

Primary data was collected via semi structured interviews with various individuals associated with the Renfrew Community Solar Garden Project in their various capacities as representatives of the community, government, management and technical consultants and others. A 'snowball' approach was chosen to identify key players and interview subjects, beginning with a review of published information available on the Project and identifying individuals at the helm of the project when it was first announced- the Renfrew Community Association and project champion' Paul Gill (Krause, 2020). Through interviews with these individuals, other partners

key to the project were discovered and contacted. In time, as new players such as solar and civil contractors were added to the project and accordingly, were contacted and interviewed.

The final list of interviewees, their respective roles and connection to the Project, and the number of times they were interviewed (in no particular order), is as follows:

1. Paul Gill, Project Champion, interviewed twice.
2. David Berrett, President (now Past President) Renfrew Community Association, interviewed twice.
3. Donald (Don) Darnell, Past President, Solar Alberta, interviewed once.
4. Alicia Cuoto, Board Member Solar Alberta and member of the Renew Community Association interviewed once.
5. Arsheel Hirji, Sustainable Infrastructure Lead at the City of Calgary, interviewed twice.
6. Dayton Bateman, Project Coordinator at CANA Group of Companies (construction contractor), interviewed once.
7. Marcus Campbell, Owner/Operator at Terralta Inc. (solar contractor), interviewed once.

Before commencing interviews, the requisite ethics application was filed with and approved by The University of Lethbridge Dhillon School of Business Ethics Committee. The interview blueprint is appended, designed for interviews lasting roughly 30 minutes. All the interviews were carried out between May 2021 and January 2022. The data collected via the interview process is analyzed using a descriptive approach. The audio was digitally recorded and electronically transcribed with the participants' permission.

Given that this is an on-going project, I felt it pertinent to interview the key players in the project more than once, to be able to track and compare the roles and motivations of said stakeholders over the course of the project. This approach enabled me to comment on expected on unexpected changes that happened in the stakeholders' landscape within the project as on-ground realities shifted during the project life cycle.

Secondary data included existing project material such as financial and environmental feasibilities, planned timelines and adjustments, shared by the Renfrew Community Association and The City of Calgary's Sustainable Infrastructure Office (reproduced/ appended with permission).

3.4 DATA ANALYSIS AND DEVELOPMENT OF FINDINGS

A description of the case is developed to build background and a contextual framework within which the remainder of the findings are presented. This description is chronological, from the conception of the project leading up to the point at which it stands at the conclusion of participant interviews. This description is instrumental in identifying themes or issues which are then discussed further thematically. The identified themes include what the evolution of the partnership landscape highlights in terms of the changing role of the stakeholders, and the preservation of 'community' as a cornerstone of the project when decision making, financing and other key roles slip away from the community's direct purview. Other themes emerge from a larger discussion of community and its significance and nuance to each stakeholder, and whether the convergence or divergence of those views plays a role in project outcomes.

A timeline of the main events in the project's life is featured, as well as a stakeholder map. This helps organize and place the various stakeholders within a larger visual context to enable better understanding of how they are connected and a comparison of their roles (Savina, 2021).

A large part of the remainder of the case analysis is devoted to understanding and describing those emergent findings in light of existing theory and drawing policy and actionable recommendations for future projects in Southern Alberta.

3.5 LIMITATIONS

One of the most common criticisms levelled at case study-based research regards the lack of generalization possible from one single case and hence the lack of a significant scientific contribution. However, it is to be noted that the case study attempts to particularize and not generalize; hence this critique has more to do with a weak understanding of a case study's research goals rather than a shortcoming of the case study method per se. The case study's strength is its ability to help understand, describe, and reveal the complexity of social phenomena, contextualize findings and highlight gaps or weaknesses in what we already know or think we know (Barr, 2004).

CHAPTER 4: FINDINGS

Before diving into the case- the remainder of this chapter- for the sake of clarity, in parts of the text to follow, the municipal government of Calgary is referred to only as “The City” for ease. This is different from ‘city’ which is used in this text just to refer to Calgary, the place.

4.1 “A SHOVEL READY PROJECT”

The Renfrew Community Solar Garden (the project or “Renfrew” interchangeably throughout this text) was conceived as the brainchild of the Renfrew Community Association (RCA) in 2018-early 2019. This project intended to be a community-led initiative in planning, funding and execution as a 1.3 MW solar PV project installed in the Renfrew community, at the Telus Spark Science Centre in the city of Calgary.

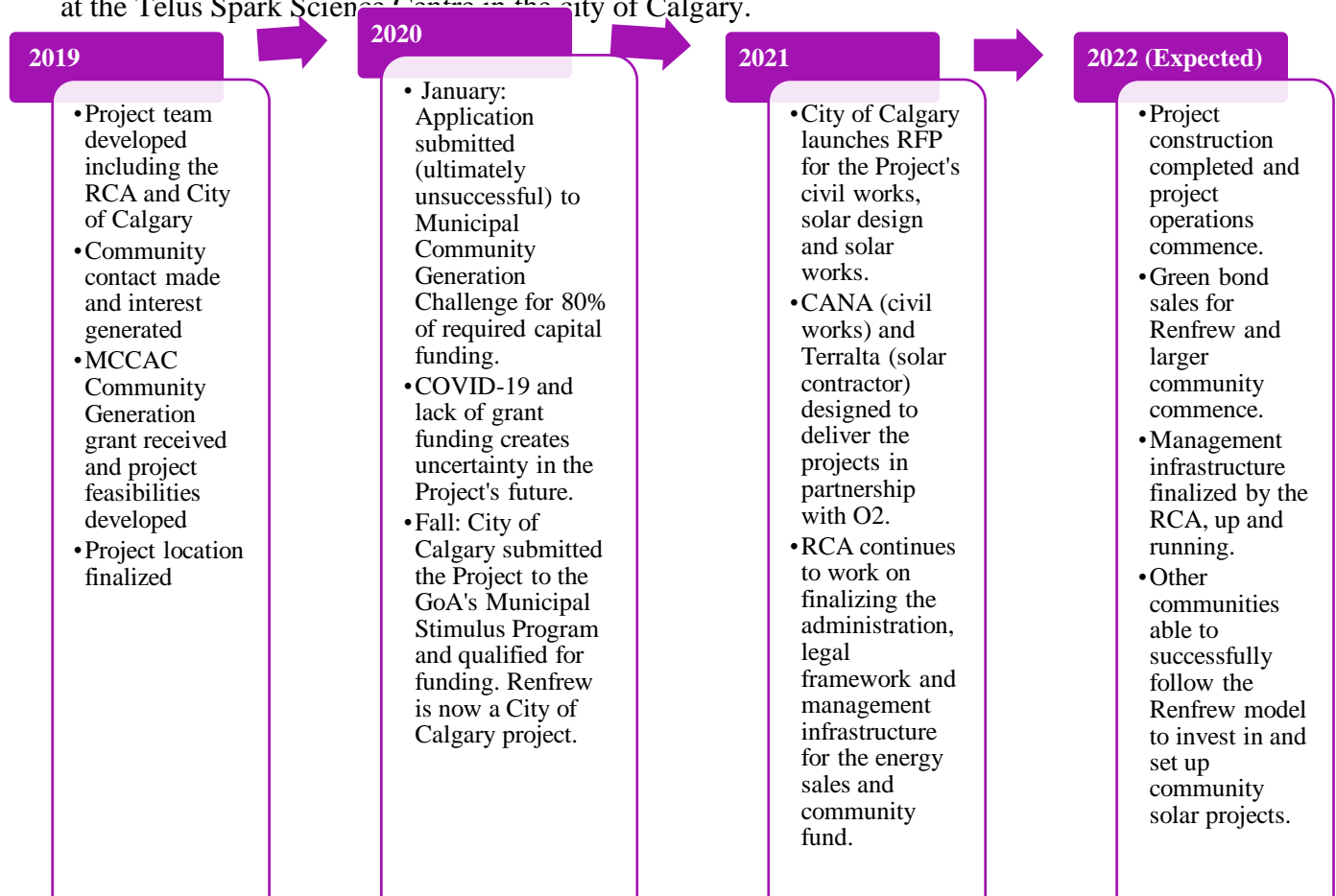


Figure 1 Project Timeline

The proposed project baseline case is a 1.32 MW Direct Current (DW) carport racking structure featuring over 3,300x400 W bifacial modules (bifacial modules capture sunlight and are able to produce energy using both sides of the panel). The Project is conceived to connect to distribution network in the vicinity of Spark, with an option of connecting behind the meter as a micro-generation project supplying Spark directly. It is expected to generate approximately 1,500 MWh in the first year of operation and offset an estimated 849 tonnes of CO₂ emissions annually. The Project will be a carport structure allowing visitors to park underneath while visiting the Spark.

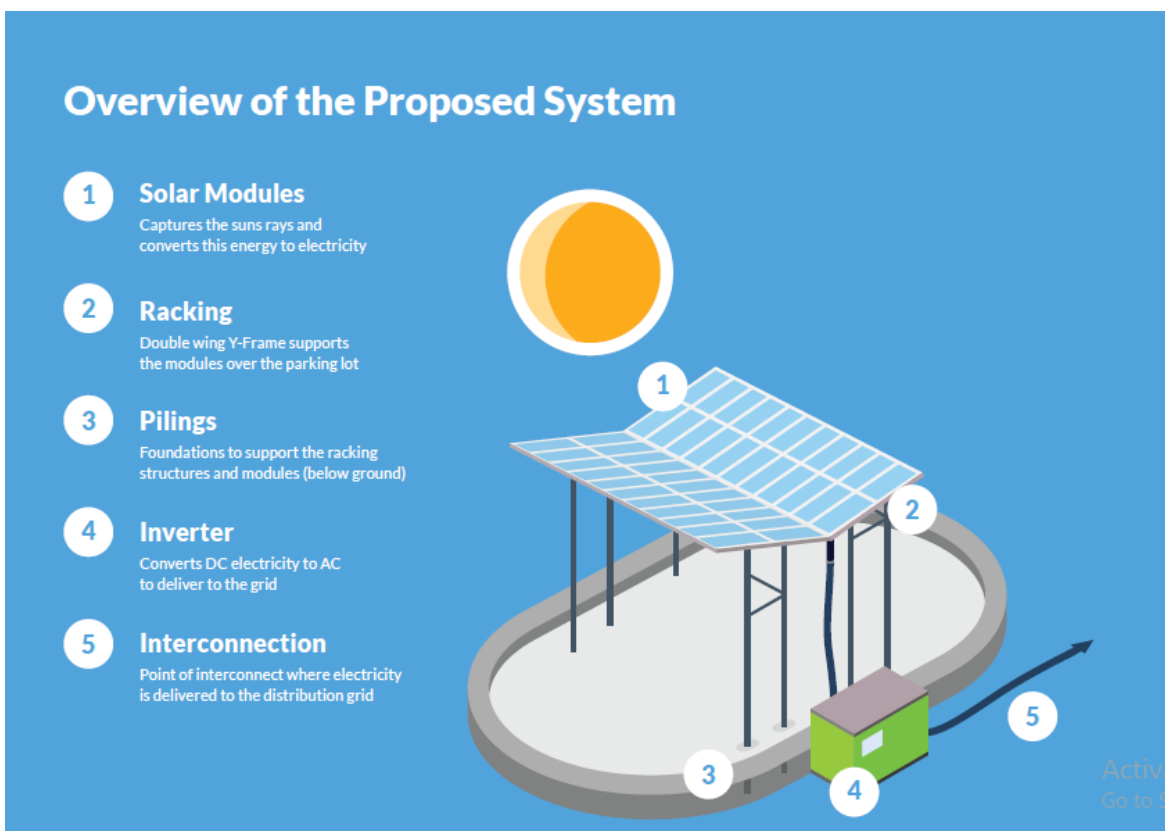


Figure 2 Proposed Renfrew Solar Garden.

The first of its kind in Calgary, many precipitating factors worked in conjunction to bring this project together. Renfrew is a thriving community close to downtown Calgary (map of Renfrew appended in Appendix B) with a mix of professionals and young families in residence,

many of whom were climate-conscious and enthusiastic about implementing sustainable energy solutions in their life. A significant number of homes in the community being older and varying in size on the smaller side and the growing number of condominium buildings, however, meant that rooftop installations were not always ideal for residents (City of Calgary, 2016). Thus, there existed a gap between the number of people who wanted to get “into the solar game” and the availability of realistic options or locations in the community for those who lived in rented or smaller spaces. It was only a matter of time that this need was recognized, and a few enterprising individuals were able to develop a plan to address this gap by centralizing an opportunity that allows interested parties to “buy in” to the idea (Barrett, 2021).

The initial community engagement, financial and environmental feasibilities were made possible by a grant from the Municipal Climate Change Action Centre (MCCAC) Community Generation Capacity Building Program. Awarded in 2019, this grant enabled the RCA to complete much of the initial groundwork for the project, before the onset of COVID-19. At this time, the project was already shaping up to be a cross sector strategic partnership (CSSP)- the City of Calgary, Solas Consulting, ENMAX and a host of other entities were already project partners with the RCA largely driving the project’s progress (see Figure 8 and 9). The RCA conceived the project to be built and operated on City of Calgary land, through an arrangement similar to that which Community Associations around Calgary have with the City- land is ‘leased’ from the City for a nominal fee while all operations are managed by communities. After some investigation on potential locations, which considered community parks, the rooftop of the Renfrew community Centre and community aquatics Centre buildings, the RCA decided on building a carport as it was the best bet for the project to remain within the community (to maintain consistency with the ‘community generation’ aspect). Going the ground mount route, although lower cost for

installation and construction, would by contrast most likely use fallow ground outside the city and thus lose a part of the ‘community’ angle.

Additionally, the location ultimately finalized for the carport, Telus Spark Science Centre, provided an additional community benefit with its potential of improving public literacy on energy and environment related matters. The Project will become an exhibit for visitors acting as a catalyst for additional renewable energy public education. The Spark’s many permanent and rotating exhibits are geared towards encouraging children and adolescents to pursue STEM careers and ‘Spark’ an interest in science and technology. The Spark’s reputation as the first “purpose-built science centre in the country in 25 years” means that the project, in addition to being commercially viable, is very on brand for Spark (Telus Spark, 2020).

After completing much of the planning-related groundwork in 2019, the RCA applied for another MCCAC and Alberta Innovates for Community grant through the Municipal Community Generation Challenge program in January 2020, for about 80% of the required capital funding for this ‘shovel ready’ project. The remaining 20% was intended to be raised by the issuance of ‘green’ bonds allowing the community to invest in and receive modest, market-comparable returns on their piece of this community energy project. In addition, the energy sales and administration of dividends and other administrative aspects of the management of the facility was envisioned to be via a community-led co-op structure. However, by March 2020 the RCA received news that this application was unsuccessful, and the project was thus without a source of majority capital funding. The full onset of COVID-19 followed shortly after and for the next few months, the future of the project remained uncertain.

In Fall 2020, the announcement of the Government of Alberta’s Municipal Stimulus Program proved to be a new lease of life for the project. The pre COVID-19 completion of

feasibilities and many aspects of the project planning meant that the City of Calgary, already a project partner and supporter of the RCA's vision for community-led sustainable energy projects, was able to pitch the project to the provincial government. The project was unanimously approved under the Municipal Stimulus Program for \$3.9 million, largely thanks to its "shovel ready" nature which meant that stimulus money could then be dedicated to project construction, leading to a quick on-ground turnaround and project completion (Hirji, 2021). While good news for the RCA in some respects, such as the obvious fact that a project dangerously close to being shelved due to a combination of global and local circumstances was now funded and ready to go to the finish line, this series of events also meant that the project was now led and managed by the City of Calgary, the recipient of the provincial grant funding, instead of the Renfrew community as initially envisioned.

4.2 PROJECT EVOLUTION

It would be unfair to say that the City of Calgary only became relevant to the project after the injection of Government of Alberta stimulus money. They had been a partner of the RCA since the inception of the project, as the RCA considered and developed ideas around installing a community solar project on City land. However, their role in the project's life did enlarge considerably once the injection of provincial funds made the City's Sustainable Infrastructure Office the de-facto project leader from 2021 onwards. The project effectively went from community-led to government-led, grassroots, informal and volunteer-managed to mainstream and formal, enmeshed in public sector bureaucracy with a hierarchy of paid professionals responsible for planning and execution. Project scope also expanded (elements of spatial design, site improvements, charging stations for electric cars were added) in line with the City's Climate Resilience Strategy (City of Calgary, 2021). As the Telus Spark Science Centre is a City of Calgary

asset, adding the solar carport to the Centre would “help address Calgary’s Council approved Climate Resilience Strategy by providing shelter to vehicles from the elements, while serving as a beacon for the community of Renfrew and the Science Centre by contributing to the local economy through job creation, technology advancement and the environmental stewardship” (City of Calgary, 2021).

While the project was originally designed to leverage the Alberta Small Scale Generation Regulation and feed into the grid, ultimately under the City’s vision the carport was executed as a microgeneration project instead, which fed directly into the Spark’s power supply effectively by-passing the grid and associated transmission and distribution charges. This was designed to create added value for both Spark and the City, as Spark would benefit through the value of the avoided costs and export revenue of any surplus energy, and the City would deal with a relatively simplified regulatory landscape.

Additionally, the City designed the project with the potential uses of a covered outdoor space such as a solar carport in mind, as a location for outdoor events, space for social gatherings- from food trucks or night markets to outdoor stages, in addition to the incorporation of the carport into Spark’s STEM focused displays and events. These ideas created a broader understanding of the carport as a multi-purpose community asset.

It is also the City’s prerogative to take, in its marketing and communications efforts, a broader view of the project in the larger context of climate policy action. City officials call the project a “poster child” for a grassroots-level energy transition, and practical demonstration of the citizenry’s desire and demand for prioritizing green energy initiatives (Hirji, 2021). This also lends itself to a political angle, with Calgary setting itself apart from the current provincial government’s

consistent lack of support and prioritization of renewable energy development in favor of Alberta's traditional fossil fuel economy (Seskus, 2019).



Figure 3 Impacts of project leadership evolution- summary

4.3 RENFREW SOLAR INC.

Community generation for the project, as initially envisioned by the RCA, had two main components. One was the community member investment driven funding for the project, and another was the co-operative management structure of the project. This involved setting up a legal framework for a trust, working in conjunction with the Alberta Eco trust Foundation through their Climate Innovation Fund, in order to manage the proceeds from electricity sales and the 'green' bond payouts to investors (see Appendix C: Sample Projected Financials).

A key part of the Renfrew community's vision for this administrative structure was also to have a mechanism enabling other communities to develop similar community-led green initiatives in *their* respective communities (See Figure 4 and Figure 5). Envisioned by the Renfrew Community Association team as Renfrew Solar Inc, the plan includes project champions from the Renfrew community staying involved in an indirect capacity (potentially as directors on the Renfrew Solar Inc. board) to maintain some oversight of the application and approval process for

new community projects. They could also potentially liaise on behalf of the concerned projects with the City or other administrative bodies if needed.

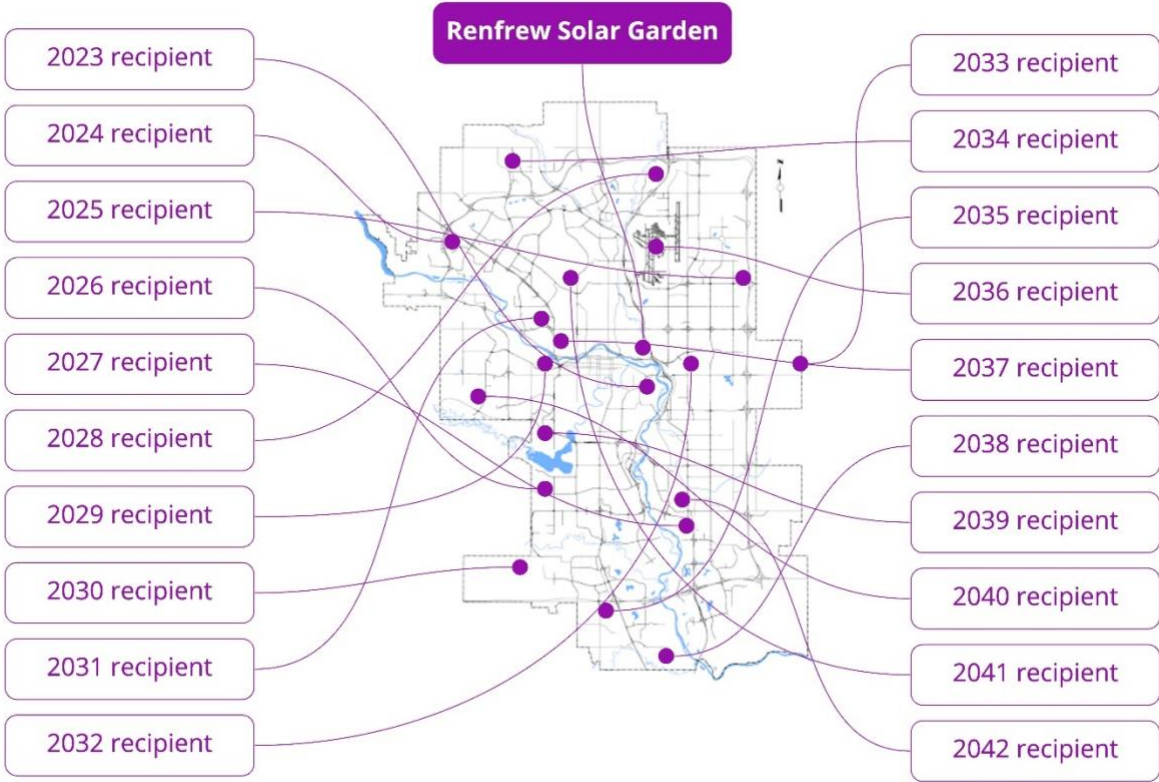


Figure 4 Proposed future outlook- community generation projects.

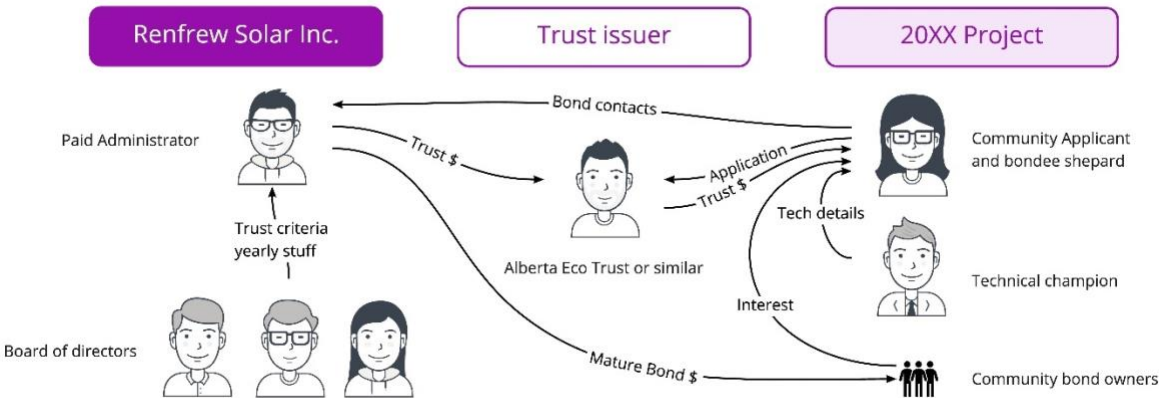


Figure 5 Proposed workflow.

As illustrated in Figure 6 below, Renfrew Solar Inc. would sit at the centre of a system where the City of Calgary has injected a one-time provincial stimulus cashflow into the Renfrew project to enable project completion. ‘Green bonds’ are also sold to help finance the Renfrew Solar Inc., which in addition to the former is funded by the proceeds of energy sales from the Renfrew project and the Climate Innovation Fund grant. Once operational, Renfrew Solar Inc. would then be in a position to ‘fund’ any new community energy projects it approves in ‘20XX’ through its reserves, potentially some contribution from the City of Calgary (on a few or all of the projects, or for a predetermined number of projects, or a period of time) as well as new bond sales for the upcoming project’s community to buy into. Throughout this process, Renfrew Solar Inc. would be managing the payment of adequate, market comparable dividends on the bonds sold and administrative or staff expenses to maintain the operations of the organization.

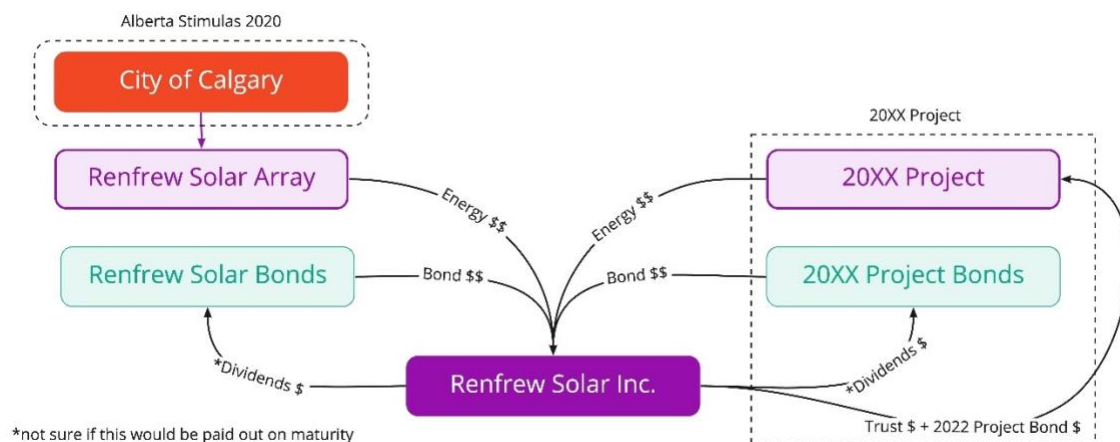


Figure 6 Renfrew Solar- Cashflow.

Figure 7 below also serves to clarify some of the ownership structures and funding sources of the major entities mentioned in this section, such as the roles of the City of Calgary and the intended Renfrew Solar Inc.

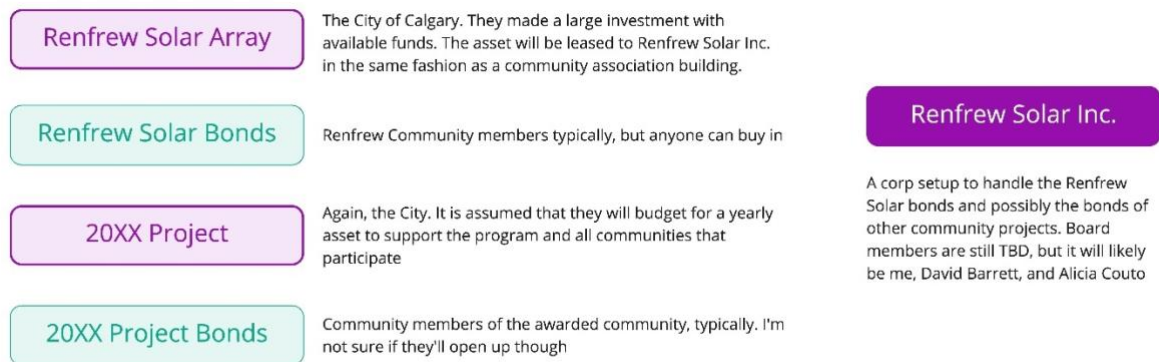


Figure 7 Asset ownership structure.

The advantages of a design such as the Renfrew Solar Inc. include, firstly, the leveraging of existing renewable energy project management infrastructure by collaborating with bodies like the Alberta Eco trust Foundation. The Alberta Eco trust, in its over 30 years as a partnership between the corporate and environmental sectors, works to “fund non-profit environmental projects, strengthen the ability of the voluntary sector to affect positive environmental change, and promote the environment as the foundation of a healthy community” (Alberta Ecotrust Foundation, 2021). This adds another layer of expertise and decreases project and financial risk going forward, helping direct attention, planning, and resources towards those aspects of the project design that are truly novel to Alberta. Additionally, this design helps create a sustainable landscape for future community energy projects. This will set up future projects for success by developing systems and clear processes for communities, dedicating resources for their use and a model to follow, which

may prove crucial for the overall long-term health of and meaningful contribution to Calgary’s energy landscape.

The Alberta Eco trust Foundation provided a grant for the incorporation of Renfrew Solar Inc. under its Climate Innovation Fund, a \$43.4 million endowment fund with a grant program for “local climate mitigation projects in Calgary and Edmonton, covering a diverse range of activities, from technology demonstration to collective impact and policy advancement” (Alberta Ecotrust Foundation, 2021). This is, however, a departure from the community led co-op structure originally envisioned (discussed in section 4.1). The project’s community focus eventually evolved from a co-op where the community would make active day-to-day decisions to bonds where the community could choose to opt-in to the project and show support with their investment, or not. The potential implications for the energy landscape and understanding of community-led energy partnerships are discussed in the section on Implications further ahead.

4.4 TOWARDS PROJECT COMPLETION

By Summer 2021, the City was able to compile and extend a Request For Proposal (RFP) for developing the Renfrew Solar Carport (the revamped project name in City communications, used interchangeably with ‘the project’ from here on) to the market. The RFP was compiled as a design build (DB) contract, which streamlines project delivery through a single contract between the owner (here, the City of Calgary) and the eventual design-build team (Design Build Institute of America, 2021).

The contract was awarded to CANA and Terralta, the former a well-established construction services provider based in Calgary while the latter is a renewable energy installations company in Medicine Hat with expertise in solar and geothermal energy (CANA, 2021). Broadly, CANA’s scope of work is limited to the project management, civil and earthworks. Terralta is

responsible for the solar array specific aspects, such as the panel installation, inverter set up and the accompanying wiring to tie the carport into Spark's electrical system.

Despite some global supply chain challenges which were then compounded by shipping delays caused by catastrophic flooding in British Columbia, a significant proportion of the project's civil installations were completed by the end of 2021 (Kickham, 2021). Thus, the provincial funding requirement that most material project activity be completed within 2021 was largely met.

The solar array installation and accompanying electrical systems were completed by February 2022. The carport became operational in Spring 2022. Renfrew Solar Inc. is expected to take over project ownership and management later in 2022.

4.5 PROJECT THEMES

This section discusses the implications of the project's life cycle and highs and lows for the community energy landscape in Calgary, the renewable energy landscape in general and for CSSPs in energy within Southern Alberta.

4.5.1. CHANGE IN PARTNERSHIP LANDSCAPE

The evolution of the project in terms of which actors became central to the partnership depending on the ways in which (primarily) major project funding changed. As seen below in Figure 8, before the provincial government's COVID-19 stimulus funding was obtained, the RCA was at the centre of the project in terms of driving project vision, decision making, and forming and directing partnership goals, activities, and outcomes. As the core team, the RCA chose to work with Solas Energy for the project's initial technical suitability and financial feasibility, making the latter an involved party for the project's initial stages. The extent of the City's involvement was

also determined by the RCA, through their decisions of choosing to install the project on City land and then involving the City in choosing the site that was the best fit. Similarly, in choosing the Spark, the City again determined their extent of participation in the partnership by making the latter the consumer or power purchaser in relation to the project.

In addition to the core team and involved partners, there were also several parties that while remaining in the periphery, enriched the project landscape with their presence and availability as a source of synergy and expertise for the former. These included the MCCAC, who awarded the initial fixed grant of \$194,200 to the RCA for the project feasibility. Skyfire Energy, ENMAX, Solar Alberta and the Alberta Solar Co-op are all industry players positioned in various capacities within the renewable energy landscape in Alberta. Skyfire is among the leading solar installers in Western Canada, while ENMAX is a utility focused on electricity generation and distribution who worked with the RCA for the initial resource assessment, which was then confirmed by Solas. Solar Alberta is a not-for-profit organization and sustainability advocate that has been facilitating the understanding and use of solar energy in Alberta for over 30 years; Alberta Solar Co-op is Alberta's first community-owned solar farm and as such was a good template for what the RCA was initially trying to establish in terms of a community owned and operated management structure.

In conjunction with all these connected and interconnected parties, a project such as this is bound to generate significant buzz and interest within the larger solar and renewables community in Calgary, Alberta, and Canada for its firsts. Given the project's positive press (Krause, 2020), the involvement of large players like the City of Calgary and Spark, the social media presence and visibility of the project has consistently been significant especially on platforms such as LinkedIn, where professionals exchange ideas regularly. Thus, the larger renewables community too can be seen as an interested party for the project.

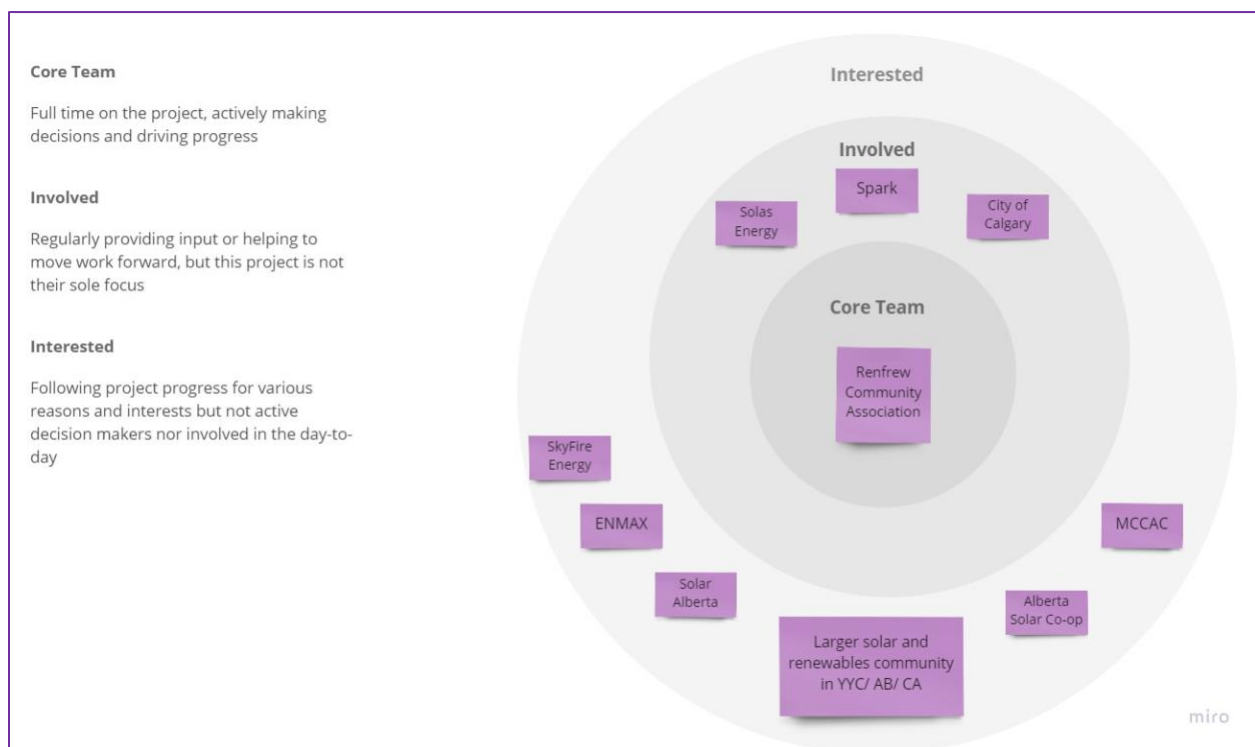


Figure 8 Project Stakeholder Map: Pre GoA Funding.

As the project progressed to being provincial government-funded, the situation in the partnership landscape evolved more in line with Figure 9, below. While some partners changed spheres of influence, a few disappeared altogether. New partners also emerged. In the core team, the City of Calgary replaced the RCA- and once the design build contract was awarded, Terralta and CANA joined the City there. Spark remained an involved partner as the active site of

construction and occasional operations support and coordination, and was joined by SMP Engineering, O2 Planning + Design and Alberta Eco trust Foundation. SMP and O2 both are engaged in the project design, while the Alberta Eco trust is the major sponsor for the Renfrew Solar Inc. and as such was involved closely with the project for the approval and application process of the Climate Innovation Fund grant.

ENMAX continued to be an interested partner, as a utilities company with growing presence and interest in renewables, while currently looking into retro-fitting other community operated buildings in the city with solar as well. The interest of the larger renewables community in the project remains as before, if not more.

The RCA is also, for the purposes of construction, an interested partner since they do effectively (and perhaps uneasily) have little control over or input for the construction phase decision making. The evolution from RCA project leadership to the City also meant that the ‘bottom-up’ or grassroots approach, an intrinsic part of community work, transformed more into a top-down, bureaucracy led and structured approach, which is less common in community projects, and less likely to be replicated for future projects without majority government funding (such as through Renfrew Solar Inc.). For the purposes of news and communication, the project is promoted as a City of Calgary initiative and while it continues to bear the Renfrew name, there is little said or written post provincial funding to highlight the original vision or its evolution. In discussion with members of the Renfrew community, it was highlighted that this shift in the project’s public outlook was keenly felt. It is understood by the community that the project is a big ‘win’ for the core team, especially the City, to highlight efforts and commitments to support Calgary’s progress towards ‘going green.’ However, the community plans to use its own communication platforms such as social media to highlight the community-first perspective, especially around the

finalization and launch of Renfrew Solar Inc. This would include messaging to highlight and raise the community's profile and communications driven from the idea that the project has roots in community effort and community vision- without which none of this would have been possible (Barrett, 2021).

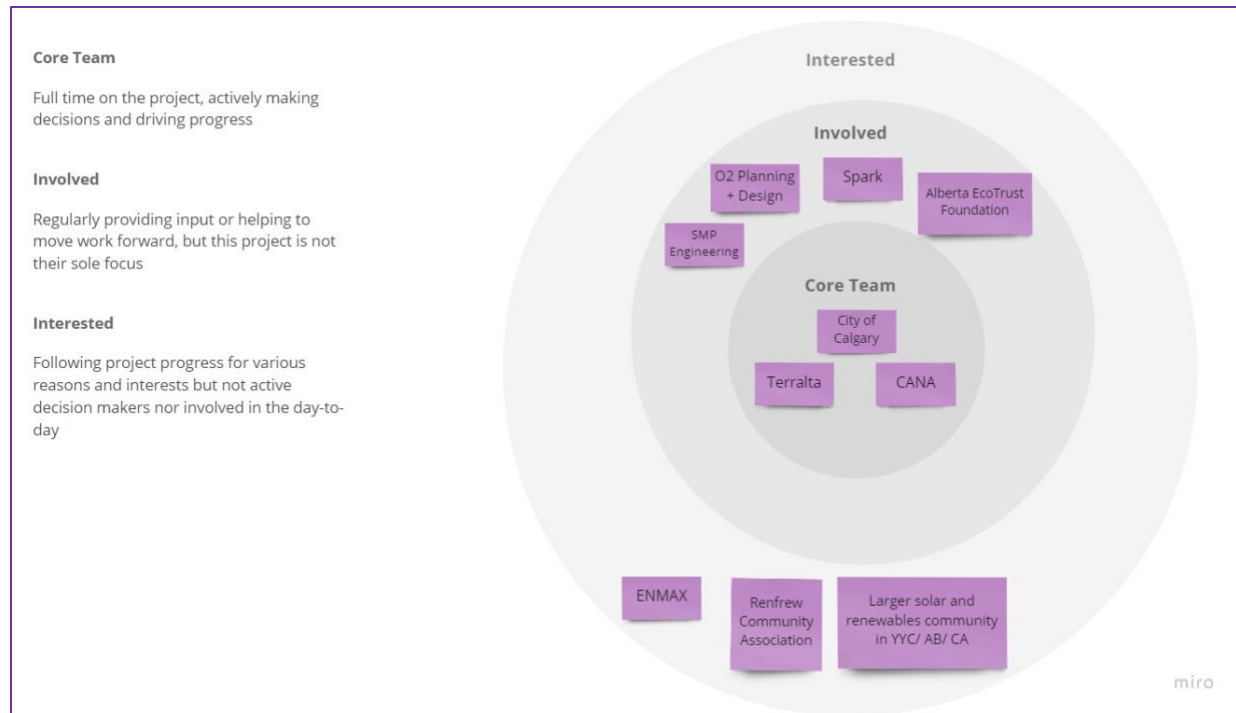


Figure 9 Project Stakeholder Map: Post GoA funding, construction phase.

4.5.2. WHAT IS COMMUNITY (TO YOU)?

The other key theme for this research is the understanding of community, and community led, and the value the carries and represents in a project such as the Renfrew Solar Carport.

This has also been among the most personally insightful parts of researching and writing this case for me, as each of the major partners shared with me their ideas of community inside and outside the project context. I started working on this project with the idea that, as informed by literature, for a community-led project to work ideally the idea of community should be shared. However, during the course of my research I discovered that community meant different things to different partners, and their ability to contribute to the project was only peripherally related to that, unless they were volunteers or engaged in a passion project.

In the case of the RCA- community was the bedrock for the ideas of all project leaders interviewed. It became clear through the course of my interviews that their understanding of community was shared and rooted in the Renfrew neighborhood, their excitement about being city or industry leaders in executing a project with this community focus which created the willingness and dedication to put their time and effort into making this project a reality. Their understanding of community-led or community-managed was also shared with the growing co-op space in Alberta and renewables as well- the Alberta Solar Co-op is named as a model for the community investment fund by community members during my interviews, and the Alberta Eco trust Foundation has a history of partnering with and funding co-ops in the renewables space.

Similarly, the City of Calgary's Sustainable Infrastructure Lead, Arsheel Hirji, who had been a part of the Renfrew community briefly and was familiar with the individual personalities of the Renfrew project champions early on as well, had context for the community aspect of the project going in. However, for the City there was, almost necessarily, a wider meaning of

community attached. The project was a “poster child” for small scale community solar, Calgary’s first, and as a City-run project there was an element of pride in the City leading and accomplishing this as *Calgary*, but not necessarily as *Renfrew*. There were also associated considerations like a lower risk appetite, a more streamlined communications and project management plan, additional bureaucratic aspects etc. that were part and parcel of mainstream City project leadership. There was also a reinforced focus on scalability and replicability for other communities, consistent with the RCA’s original vision, with a focus on design since the “urban improvement/uplift” element was a necessary consideration of community work throughout Calgary for the city government. This design aspect was also informed by the City’s motivation to develop multi-use outdoor spaces for social events available to the community and to Calgary at large.

Taking other partners’ views into account through interviews with representatives of Terralta and CANA, a more nuanced understanding of community developed. It was also interesting to see that since these partners were engaged as paid contractors on the project, their understandings and community-related motivations played little if any role in the ultimate outcomes. In conversation with the team at Terralta for instance, the solar contractors and installers for the project, it quickly became obvious that the understanding of community and partnership both revolved around the renewables’ community, or the solar community- described to me as a relatively well engaged group, small enough still for many if not most members of this community to be friendly with each other and in-the-know about what the major developments are around the city at any point. It was also shared that there is the understanding that any time a solar project is successful, from panels on a roof to a retro-fit office building to a larger ground mount powering multiple homes or farms, it advances the cause of solar energy overall and drives the community ahead. Thus, this view of community is in many ways a departure from the Renfrew community’s

vision. There is less of a sense of identifying with that initial idea of community, and more of a branching out into what helping execute a solar project with multiple large partners can do for the solar community's profile and credibility.

Other contractors like the Project Manager at CANA mentioned being buoyed by the idea of Canada's renewable space beginning to catch up to that of, for instance Europe, where community generation has been around for decades. The fact that project delays were in no small part due to imported panels and structures that were then additionally held up as a result of the floods in BC in late 2021 helped reinforce the idea that more Canadian manufacturers are needed, and more self-reliance needs to be built into the Canadian and Albertan renewables system- yet another iteration of community.

Thus, the understanding of what a community is, and which community (s) different partners identify with, meanders and changes with their various roles in the project. I can conclude from my interviews that there seems to be, especially post provincial funding, a general widening of the community understanding which prior to that was rather tight and limited to the physical location of the project. In some ways, this can be a good thing- a wider understanding means more people and structures can be included within it, galvanizing a larger set of population to care or to participate. However, I am also reminded here of Bobby Banerjee's discussion around stakeholder selection (Banerjee, 2008) where power, legitimacy and urgency ultimately dictate the extent to which stakeholders are heard. Does this widening of the understanding of community in fact mean that in some ways, the power and legitimacy of the RCA's initial vision is eroded? This is also among the key takeaways of this study, so future community-led initiatives are paying particular attention to the narratives built around their project and make conscious effort to direct and lead those from day 1.

Based on the case study and analysis presented in this chapter, I link these findings with my research questions in the next section, where I conclude this study.

CHAPTER 5: CONCLUSIONS

In this section I connect the findings of the case study with my research questions, discuss implications for theory and practice, and close with some limitations, ideas for future research and a brief recap of the salient points discussed in this thesis.

5.1 IMPLICATIONS

5.1.1 IMPLICATIONS FOR THEORY

Regarding the extent to which lessons from literature on community partnerships in sustainable energy elsewhere apply to Southern Alberta (research question one of three), some encouraging findings come to light. Literature reports, for instance, that communities involved with sustainable energy projects report increased social cohesion, a heightened sense of duty and greater willingness to experimenting with alternate ways of living and alternate energy systems (Allen, Sheate, & Diaz-Chavez, 2012; Seyfang, Hielscher, Hargreaves, Martiskainen, & Smith, 2014). Involvement with community energy projects also helps address the “value-action” gap- the difference between sustainable attitudes and sustainable behavior, as well as learning and skills transfer for future projects (Parag, Hamilton, White, & Hogan, 2013).

These findings are confirmed by my research on the Renfrew project. The project is, in a way, the result of a community willing to lead the way in increasing the extent to which sustainable practices and behavior can be incorporated into daily lives- addressing the value-action gap. Similarly, the ways in which literature shows that community projects can highlight areas where more policy oversight is necessary is also seen replicated- the City of Calgary was able to direct provincial funding to this project, the only sustainable energy project approved under the Municipal Stimulus Program, due to the Renfrew community’s drive and work on it beforehand.

Seyfang et. al. (2014) find that the driving force for community-led initiatives is often social or environmental need, as opposed to rent seeking (Seyfang, Hielscher, Hargreaves, Martiskainen, & Smith, 2014). The same can be said for the Renfrew project, where the community investment was driven not by higher-than-market returns, but by the desire to make investing in solar more accessible for their community and also develop a framework for other communities to realize projects like this easier and better in the future.

Additionally, community led energy projects are organized in diverse structures such as cooperatives, voluntary organizations, and other community initiatives. The resource base they may draw on can be similarly diverse, beyond just formal loans and commercial income (Parag, Hamilton, White, & Hogan, 2013). This is seen in effect in the Renfrew project as well, where various options for organization and funding- such as co-ops, volunteer organizations, sale of bonds, grants from provincial government and trust organizations are all in the mix.

Moreover, literature supports the finding that community-led projects are not undertaken to maximize financial gain (Parag, Hamilton, White, & Hogan, 2013; Rhodes, 2000) - the primary benefit is the shared practicing of green values and contributing to the community's welfare and uplift.

Most of the main outcomes of community and community led projects from literature are then seen replicated in the case of the Renfrew project. The fact that most of these findings are drawn from cases outside Canada or North America, does not seem to have a significant impact on the results.

With regards to attitudes and values within the community having an impact on community partnerships in sustainable energy (research question two of three), it was interesting to note that

none of the research participants, regardless of their role in the project and partnership landscape, had anything except positive attitudes and cooperative relationships to report. This may be a natural consequence of the fact that a volunteer led organization would only be able to spend time and effort on something, or successfully accomplish anything, if motivations aligned and relationships were conducive to productivity. Similarly, for a partnership as diverse and evolving as Renfrew to work is evidence of the fact that partners did gel well, or that problems encountered were solved- potentially due to the presence of a similar value system and a similar outlook. It is also possible however that there were evolutions within the partnership or partners, such as the RCA leadership, evolving in a way that those with attitudes and values non-conducive to the project ended up leaving or quitting the project, where others who were more adaptive or able to work better with other members took on more responsibility or bigger roles. Unfortunately, none of the interview participants shared any information of this nature.

In some cases, such as the representatives of the City of Calgary, the interviewee's motivation to only put one's best foot forward is easily understood- these are government employees, and perhaps deal with researchers just like journalists, by sharing only what their organization would want to see in print. However, for some others, the motivation to only discuss the positive aspects- in case there were instances of negative attitudes or hurdles available to be shared- are less obvious. Regardless, it seems that values and attitudes, for this project at least, were overwhelmingly positive and conducive to project outcomes, therefore only served to drive the project agenda forward.

Lastly, regarding contributions to theory about community partnerships in sustainable energy projects (research question three of three), a few aspects can be highlighted here. Among the most significant findings is the highlighting of practical aspects and roadblocks of

implementation in community energy projects, the ways in which partnership dynamics adapt and the highlighting of particular challenges in the post COVID era. Given that literature does express overwhelming support for community energy but there is still a need for clarity on implementation (Goedkeep & Devine-Wright, 2016; Terrapon-Pfaff, Dienst, König, & Ortiz, 2014), studying projects like Renfrew in detail can contribute to building better project models, more realistic expectations within communities looking to start similar projects or partnerships, as well as highlight for policy makers the most common or obvious roadblocks that can be managed to encourage and give community projects a greater chance of success.

5.2.2 IMPLICATIONS FOR PRACTICE

Perhaps the most important takeaway from the Renfrew project is the way in which it can help inform and streamline future community-led energy projects in Southern Alberta. This is important also because the Renfrew project team itself aims to enable other projects through the setup of Renfrew Solar Inc. and replicability has been a key part of the mission of the RCA and the City of Calgary.

Overwhelmingly, the project's progression tells a positive and encouraging story for those interested in attempting something similar. It seems intuitive to those studying this project- through the successful contribution of partners like community, government, utilities (ENMAX), consulting and contractors- that community and small scale solar is now viable as a niche distinct from installing panels on one's home or setting up a ground mount solar farm. The resources that the Renfrew project has been able to access also shows that there are solutions available in the city to address important considerations like location, financing, provision of management and technical advice, which make community led energy projects increasingly feasible.

Another vital element is the importance of the partnership model. The Renfrew project was set up as a CSSP from its inception, a partnership that focused on building a portfolio of supporting players for the community's vision, able to advise and help navigate the uncertain waters of the first such initiative in the city. The RCA connecting with key partners such as the City of Calgary early on helped establish trust and clear communication, which in turn contributed to the City feeling confident in pitching and advocating for the project at a crucial stage for the provincial stimulus funding. Similarly, the partnerships with Alberta Solar Co-op early on and then with Alberta Eco trust at a later stage really helped the project capitalize on existing management and financial solutions and models which Renfrew Solar Inc. is now going to be informed by. Undoubtedly, without these strategic partners project timelines would have been stretched much farther out for the project and made project completion significantly less likely, especially given the general nuisance of trying to accomplish anything meaningful in a global pandemic.

Other takeaways are more general and generalizable in nature. Projects with a clear vision and plan, as well as a knowledgeable and motivated team have better chances of success. Projects that are able to pivot and 'roll with the punches' are more likely to come out on top, especially when faced with changing external conditions. Lastly, that COVID-19 is and was unpredictable and compounded existing project-related challenges by disrupting funding, government priorities, global supply chains and forcing individuals and organizations to reexamine many of the things we all took for granted.

5.2 LIMITATIONS

This study's limitations include some aspects of data collection. Despite my best efforts, I was unable to speak with multiple members of the City of Calgary team as regularly and as extensively as I wanted. There were scheduling and other conflicts and in some cases a lack of

response altogether to some requests for an interview and for archival documents that would have been valuable as additional secondary data included in this case study.

All the interviews were conducted virtually, another prominent effect of the pandemic on this research, which is less ideal for an in-depth conversation, especially an interview format since body language and non-verbal cues are almost entirely lost in the process.

Similarly, in the absence of the pandemic and pandemic-related project delays I would have prioritized interviewing project partners on-site for the project, possibly gaining rich context for the case in addition to the answers I received in virtual interviews, but again due to the pandemic that did not prove possible, feasible or time-effective to do.

In terms of research findings, one clear limitation stems from the fact that the project is still on-going and has not yet reached completion. There is a small, non-zero chance that between now and project completion, some unexpected event may happen that could potentially change the course of the findings and the project overall. However, due to the priorities of degree completion and keeping in mind the various delays that the project completion has already been subject to, and which have been accounted for in this research, it was deemed prudent by the researcher and supervisory committee to cap data collection and gather findings at this time.

5.3 FUTURE RESEARCH

Given the space opening in Calgary with this project, the city's first community small scale solar installation, future research has incredible scope in the area. The research gaps identified pertaining to research on community led energy projects in North America cannot be filled without projects that such research can be based on. Thus, this project can presumably be said to mark an

exciting and prominent beginning in the community renewables landscape in Southern Alberta, leading to other similar research endeavors.

Projects can be studied not just using case studies but through ethnographies, grounded theory or other qualitative and quantitative methods combined with or separate from case studies. This will add both depth and breadth to the data and analysis available, allowing a richer comparison and dissection to be possible for future students in the area.

Additionally, with regards to the Renfrew project, one important area of future research can be to study the project once it is complete and generating power, or to compare its actual performance and impact on community solar in Calgary with its initial aims (such as the creation of enabling mechanisms for other community energy projects), a few years down the road. It might also be useful for future researchers to test the conclusions and assertions made in this paper- that many of the social and community benefits of community energy are found replicated in Southern Alberta, or the influence of partners' positive working relationships but lack of evidence of negative or less than positive working relationships on project outcomes- and examine those in a different project to explore replicability and scalability of those findings. Whenever it is that we're not in the throes of uncertainty and existential dread due to a global pandemic, researchers could also hold interviews and observation on site for projects, see stakeholder and partner relationships play out in real time at in-person project meetings or site inspections, and add that additional dimension to their research on community energy partnerships that is limited in mine. Some specific research questions to ask might include, what is the impact of different project ownership models on outcomes (split ownership, ownership through a community trust, direct ownership and management, etc.)? What is the impact of working with a large corporate or business partner, as opposed to the government- how would 'bottom line' considerations affect the project

considerations/priorities mix? Other research can focus on unsuccessful community projects- and examine the reasons for lack of project completion to better understand critical success factors. As stated previously- the identified gaps in literature around community projects in Alberta, Canada and/or North America mean that there remains room for closer examination in a myriad of ways within this space for the near term.

5.4 FINAL OBSERVATIONS

I conclude this section and this study with a review of the salient points I have discussed and some highlights of what I was able to discover and present. As a researcher, my interest in studying about and writing this case study of the Renfrew Solar Garden (the project), Calgary's first community-led renewable energy project, stems from several avenues. These include, but are not limited to, a focus on sustainability, clean energy and climate change in general as a long-term research interest and an overarching desire to work within this space, especially in the Canadian context. My interest in the dynamics of partnerships, especially those aspects less easy to quantify or measure on a scale, such as attitudes and values, also contributed to my eventual choice of project. Further, most of my understanding of community-led energy partnerships developed through lived experience and reviewing literature based in European countries like Germany and Denmark, which led to a curiosity about which if any of those findings could be replicated or generalized to projects in Southern Alberta, with its unique political and economic landscape. It also piqued my interest that the project was the first of its kind in Southern Alberta, certainly in Calgary, and thus the associated outcomes could be encouraging (or lack thereof) for future growth in this space as well. My research questions thus, were primarily around the extent to which findings from global literature applied to the project, the impact of values and attitudes on

outcomes within the partnership, and the lessons or insights generated from this case which could potentially inform and build theory in this space.

The bulk of my primary research comprised semi-structured in-depth interviews with project stakeholders, such as representatives of the Renfrew community, associated non-profits, government, and technical consultants brought on in the later stages of project execution. Through what I learnt from these interviews, conducted over the better part of a year, I found myself able to construct the story of the project- its beginnings, pivots, changes of course and ultimate route to project completion- all the while with the shadow of COVID looming (if not spreading) over the horizon. I present a project timeline, a set of stakeholder maps, and some secondary data on how the community representatives envision this project leading the way for community energy to take off in Calgary by setting up a monitoring, approval, and funding mechanism through the returns this project will generate. I find that the bulk of existing findings from literature on community-led energy projects, such as the primary motivations of participating communities, the usual set of success indicators, and even the likely outcomes of such initiatives, are replicated. I do not find evidence of varying attitudes and values within the project, which is why I cannot conclusively say how project(s) can be impacted by attitudes less than positive and values less than aligned within the team. I do conclude that community initiatives are important to identify gaps in public policy priorities, projects that establish trust and communication early on thrive and emerge stronger through potential adversity, and project champions are underrated in their ability to work towards addressing perceived value-action gaps.

This study is limited by being conceived and executed in a global pandemic, the absence of which would have allowed more extensive and in-person data gathering (and probably a less stressed and fatigued researcher), tighter project timelines and potentially, a different project cycle

altogether. I also finish gathering data before (just shy of) official project completion, which may limit the validity of my findings.

I suggest further avenues for related research to be around testing of my findings by examining them considering project outcomes in other community-led energy projects in Southern Alberta or examining the effect of an influential corporate or business partner (the bottom-line consideration) on project outcomes, or a study on an unsuccessful project- where the partnership falls apart, or project outcomes are not achieved. Another prominent avenue of related research could be a longitudinal or project evaluation-centric study of the Renfrew project some years in the future, where its impact and role as a pioneer in this space within Southern Alberta is examined and evaluated.

In doing this study and presenting these findings, I hope to generate interest in community generation and cross sector strategic partnerships (CSSPs) driven by communities and be able to gather and share insights for policy practitioners, community members, and students of sustainability and clean energy advocates like myself. I am indebted to everyone who has contributed to this study being completed, and I am grateful for the time, interest, and feedback of everyone who has read it to this point. Thank you all.

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APPENDIX 1: INTERVIEW BLUEPRINTS

Introduction		
<p>Hi, my name is Maham, thank you for making the time to speak to me today. I will now begin the ____ (audio/video) recording.</p> <p>We are speaking today after you consented in writing to be a part of my research. Thank you for that. This interview is entirely voluntary, and you can choose to answer or decline to answer any questions I am about to ask. There is no penalty for not participating, or compensation for participating. In case you feel, at any point henceforth, that you do not wish to participate any further please indicate so verbally. I will stop recording and ask you no further questions. If you so wish, in my research findings I will also not include any information you had shared in the interview until that point either. Please let me know if I can answer any questions or clarify anything for you before we begin.</p> <p>Great, let's begin. I would like to start off by asking:</p>		
Research Question	• Interview Questions	○ Probes
To what extent do findings and learnings from literature on community partnerships in sustainable energy projects in other parts of the world apply to projects in Southern Alberta?	<ul style="list-style-type: none"> • What is your understanding of 'partnerships'? • What similarities can you think of that this project has with other solar projects in Alberta? Other solar projects in Canada? • What were your expectations about the project's community-focused approach? Have they changed? How? Why/ why not? • What unique challenges do you think the project faces? 	<ul style="list-style-type: none"> • Do you enjoy learning about other renewable projects in or outside or Alberta? • Do you think others with expertise on projects from outside Alberta can make meaningful contributions to this project? Why/ why not? If yes, how? • How do you feel about trying to make this a more replicable/scalable model for other cities

		and towns? What can be done towards that?
How can attitudes and values within the community impact community partnerships in sustainable energy projects?	<ul style="list-style-type: none"> • What is your understanding of ‘community’? • Can you tell me about your background and interests? • How is the Renfrew community association organized? • What are you most excited about for the future of the project? • What do you think has been the most challenging aspect of this project so far? How has it been handled? What could be done better? • Do you anticipate any challenges to successful project completion? 	<ul style="list-style-type: none"> • Is there a selection process for members? What industries do most volunteer members work in? • How is volunteer work organized? How has it changed over the years? • How is/was decision making done within the community about the project? How do you feel about the decision-making process? • Were you looking for any particular characteristics, ideas or attitudes in other partners while working on this project? • How do you feel about the corporate partner (choice of partner, process, outcomes)? • How do you feel about the role of the government (choice of partner, process, outcomes)?
Conclusion		
<p>Thank you for your time once again. Those are all my questions for now. I will shortly send you a transcript of the conversation we are having for your record. Feel free to get back to me at any point within the month/4 weeks in case you would like me to exclude some, or all of the information contained herein, or if you would like changes to your previously stated preferences of using your name or a pseudonym. I am now going to stop recording.</p>		

APPENDIX 2: INTERVIEW GUIDE

1. Can you tell me about your role at Terralta and within the Renfrew project? What is your background and what are some of your interests?
2. What is the project scope as it relates to Terralta's role and responsibilities for the project? What are the timelines for major deliverables?
3. What does a partnership mean to you?
4. What is your understanding of 'community'?
5. What similarities can you think of that this project has with other solar projects in Alberta? Other solar projects in Canada?
6. What unique challenges and opportunities do you think exist within this project?
7. Do you think others with expertise on projects from outside Alberta can make meaningful contributions to this project? Why/ why not? If yes, how?
8. How do you feel about trying to make this a more replicable/scalable model for other cities and towns? What can be done towards that?
9. What are you/Terralta most excited about for the future of the project?
10. What do you think has been the most challenging aspect of this project so far? How has it been handled? What could be done better?
11. What in your opinion are some possible future challenges to successful project completion?
12. What characteristics, ideas or attitudes in other partners have you encountered while working on this project?
13. How do you feel about the corporate partner (choice of partner, process, outcomes)?
14. How do you feel about the role of the government (choice of partner, process, outcomes)?

APPENDIX 3: MAP OF RENFREW

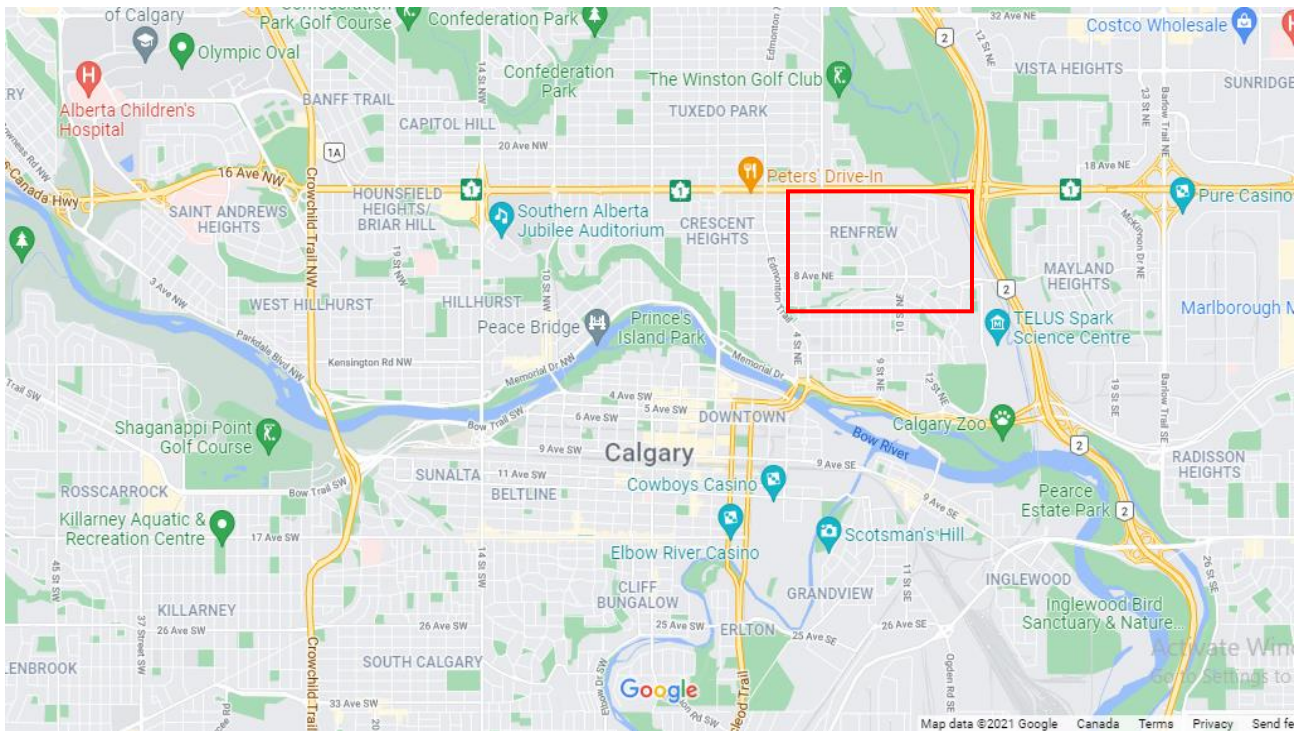


Figure 10 Map of Renfrew

APPENDIX 4: SAMPLE PROJECTED FINANCIALS- RENFREW SOLAR INC.

bond years	Energy Sales	Bond sales	Op costs	Bond payout	Gross Rev	Reserve payout	Net Rev	Reserve %	Reserve	Reserve Pool	Trust payout	Operational parameters
01/01/2022	120,000	100,000	(22,000)	0	198,000	0	198,000	50%	99,000	99,000	99,000	ROI on bond 2.9%
01/01/2023	118,800	100,000	(22,000)	0	196,800	0	196,800	50%	98,400	205,296	98,400	Yearly Op cost (25,000.00)
01/01/2024	117,612	100,000	(22,000)	0	195,612	0	195,612	50%	97,806	315,226	97,806	Energy first year 120,000
01/01/2025	116,436	50,000	(22,000)	0	144,436	0	144,436	30%	43,331	372,899	101,105	Admin hire (cost) 10000
01/01/2026	115,272	50,000	(22,000)	0	143,272	0	143,272	30%	42,981	432,516	100,290	Op cost (solar) 1000
01/01/2027	114,119	50,000	(22,000)	0	142,119	0	142,119	30%	42,636	494,157	99,483	Bond length (yr) 10
01/01/2028	112,978	50,000	(22,000)	0	140,978	0	140,978	30%	42,293	557,909	98,684	Reserve pool interest 4
01/01/2029	111,848	50,000	(22,000)	0	139,848	0	139,848	30%	41,954	623,858	97,893	Bond purchase numbers
01/01/2030	110,729	50,000	(22,000)	0	138,729	0	138,729	30%	41,619	692,096	97,111	Original payment 10000
01/01/2031	109,622	50,000	(22,000)	0	137,622	0	137,622	30%	41,287	762,717	96,335	Purchase date 01/01/2022
01/01/2032	108,526	0	(22,000)	(140,845)	(54,319)	54,319	0.00	0%	0	853,534	80,000	Yearly Fee 110
01/01/2033	107,441	0	(22,000)	(140,845)	(55,404)	55,404	0.00	0%	0	538,855	80,000	Maturity date 01/01/2032
01/01/2034	106,366	0	(22,000)	(140,845)	(56,479)	56,479	0.00	0%	0	418,471	80,000	Maturity amount 14084.50704
01/01/2035	105,303	0	(22,000)	(70,423)	12,880	(12,880)	0.00	0%	0	365,405	80,000	Net return 12964.50704
01/01/2036	104,249	0	(22,000)	(70,423)	11,827	(11,827)	0.00	0%	0	309,121	80,000	Total ROI 29.85
01/01/2037	103,207	0	(22,000)	(70,423)	10,784	(10,784)	0.00	0%	0	249,502	80,000	Annualized ROI 2.96
01/01/2038	102,175	0	(22,000)	(70,423)	9,752	(9,752)	0.00	0%	0	186,425	80,000	Revisi Mike's financial model
01/01/2039	101,153	0	(22,000)	(70,423)	8,731	(8,731)	0.00	0%	0	119,761	80,000	
01/01/2040	100,142	0	(22,000)	(70,423)	7,719	(7,719)	0.00	0%	0	49,380	80,000	New variables to integrate for better accuracy:
01/01/2041	99,140	0	(22,000)	(70,423)	6,718	(6,718)	0.00	0%	0	56,097	80,000	cost of elec 65/mwh
	2,185,116.75	450,000	(440,000)	(915,493)							1,762,206	
	Produce 2.2M in clean energy			ROI for community that is helping support local infrastructure							Inject 1.7M into calgary communities	
golden years	Energy Sales	Bond sales	Op costs	Bond payout	Gross Rev	Reserve payout	Net Rev	Reserve %	Reserve	Reserve Pool	Trust	
01/01/2042	98,148.83	0	(25,000)	0	73,148.83	0	73,148.83	100%	73,149	73,149	0	
01/01/2043	97,167.34	0	(25,000)	0	72,167.34	0	72,167.34	100%	72,167	145,316	0	
01/01/2044	96,195.67	0	(25,000)	0	71,195.67	0	71,195.67	100%	71,196	216,512	0	
01/01/2045	95,233.71	0	(25,000)	0	70,233.71	0	70,233.71	100%	70,234	286,746	0	
01/01/2046	94,281.38	0	(25,000)	0	69,281.38	0	69,281.38	100%	69,281	356,027	0	
01/01/2047	93,338.56	0	(25,000)	0	68,338.56	0	68,338.56	100%	68,339	424,366	0	
01/01/2048	92,405.18	0	(25,000)	0	67,405.18	0	67,405.18	100%	67,405	491,771	0	
01/01/2049	91,481.13	0	(25,000)	0	66,481.13	0	66,481.13	100%	66,481	558,252	0	
01/01/2050	90,566.31	0	(25,000)	0	65,566.31	0	65,566.31	100%	65,566	623,818	0	
01/01/2051	89,660.65	0	(25,000)	0	64,660.65	0	64,660.65	100%	64,661	688,479	0	
	938,478.77		(250,000)									
	Produce 1M in clean golden years energy			Inject 250k more into local business								\$ to buy new modules and start the process over

Figure 11 Renfrew Solar- draft cash flow