

## Multi-stakeholder Networks: Developing High-Performance Low-Income Housing within the Doughnut

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**Abstract:** The need for additional affordable housing units in Manitoba is growing. Housing that only meets the National Building Code is inadequate to maintain affordability in the long term given rising energy costs and the effects of climate change on weather. Research shows that high-performance and resilient building methodologies can help to drastically reduce Total Cost of Building Ownership (TCBO) though their implementation requires additional capital in the construction phase. The aim of this research project was therefore to study the feasibility of creating a Multi-Stakeholder Network (MSN) in Winnipeg, Manitoba that would leverage the capabilities and resources of stakeholder members to reduce the upfront cost of constructing low-income housing units to a high-performance and resilient building standard. The Doughnut Economics (DE) concept provides context for why co-operatives should measure the environmental and social impact of business activities to ensure that they stay within the “doughnut”, a visual representation of the space between environmental and social boundaries where humanity can thrive. The research identified five key stakeholder groups that would provide core competencies to meet the MSN's objectives. Each stakeholder completed a questionnaire to corroborate the hypothesis regarding their contributions and to gauge interest in MSN membership. The results determine a high probability that our MSN concept could be implemented in Winnipeg. The research builds on the understanding of affordable housing needs in Winnipeg and identifies the TCBO savings potential of high-performance and resilient building measures. Recommendations are made for systems-based frameworks with absolute performance targets like the Passive House building standard and DE to achieve desired outcomes. This research project also highlights the importance of trust, reciprocity, and shared values and principles in reducing the governance costs of MSNs.

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**Keywords:** Multi-Stakeholder Network, Doughnut Economics, Co-operatives, Low-Income Housing, High-Performance Buildings

### Introduction

Social and environmental issues are becoming more and more complex to the point that no single organization can sufficiently address them (De Bakker et al., 2019, cited in Eikelenboom & Long, 2022; Wageningen Centre for Developmental Innovation, 2019). Research has shown that networking has the potential to create “innovative organizational forms . . . [which are] a strategic advantage for co-operatives” (Novkovic, 2014, p. 47). Multi-Stakeholder Networks (MSNs) provide a diversity of perspectives that can help to drive “values-centred decision-making . . . toward a shared purpose” (Martins Rodrigues & Schneider, 2022, pp. 32–33), which reduces transactional and governance costs (Novkovic & Holm, 2011). Co-operative business models are typically aligned with progressive ideals of sustainability through their adherence to *Concern for Community*, the seventh principle of co-operatives (International Co-operative Alliance [ICA], 1995); however, the rapidly deteriorating global economy requires co-ops to move beyond sustainability towards regenerative economic models like Doughnut Economics (DE) (Novkovic, 2020; Miner & Novkovic, 2020; Raworth, 2017b; Wilson et al., 2021). The DE model visualizes social and environmental boundaries and provides a framework to analyse economic activity, ensuring it adequately addresses social issues while not disrupting critical ecosystems (Raworth, 2017a). Through the context of DE, this research project proposes the development of an MSN to address the challenges of developing low-income housing to a high performance and resilient building standard and determines the feasibility of creating such an MSN in Winnipeg, Manitoba.

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This research builds on the understanding of network governance best practices and highlights the importance of trust and diversity in stakeholder networks. It contributes to the understanding of affordable housing needs in Winnipeg and makes recommendations for the use of high-performance and resilient building measures to reduce the Total Cost of Building Ownership (TCBO). This research also shows the importance of incorporating absolute as opposed to relative performance targets in relation to project analysis which provides context for choosing systems based frameworks such as DE and the Passive House International (PHI) building standard (Bernhardt, 2020; Raworth, 2017a).

### Background

#### *High-Performance and Resilient Housing*

Models of low-income housing development that do not meet high performance and resilient building standards do not adequately address the needs of low-income families. Housing units that only meet the Manitoba Building Code create a liability for building owners and tenants as the Code's requirements are insufficient to protect them from energy, maintenance, and recapitalizations cost increases, severe weather events, or natural disasters (Cole, n.d.). Using lower-quality components and finishes leads to more frequent maintenance and recapitalization of building components, which can increase in frequency and cost as the building ages. Building materials that contain high amounts of embodied carbon from their manufacture and transportation contribute to greenhouse gas emissions which in some cases can surpass the lifetime emissions created by the building's operations (Magwood, 2018). The TCBO analysis shown in Figure 1 illustrates how the implementation of high-performance and resilient building methods at the time of construction can drastically reduce the energy consumption, carbon emissions, cost of maintenance, and cost and frequency of recapitalization of components over the building's useful lifetime (Cole, 2018) compared to a Code built version of the same building. The TCBO model also shows that up to 78% of lifetime ownership costs are spent on energy, maintenance and replacing ageing components, while roughly 20% are spent on the cost of construction. The remaining 2% of TCBO is allocated to demolition and recycling at the end of the building's useful lifetime (W. Cole, personal communication, June 2018).

Figure 1: Total Cost of Building Ownership Analysis - Manitoba Case Study

MANITOBA CASE STUDY

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Minimum Code Compliant Home vs High Performance Home



The durability and sustainability of building material is important because it has an impact on how often building components need to be replaced and at what cost. An easily recyclable metal roof with a 60-year plus life is more durable than asphalt shingles with a 20-year life that end up in landfill. In addition, occupant comfort, productivity and a building free from harmful materials is important. In an effort to simplify the analysis for this study, however we do not include a comparative analysis of options for more durable materials.

This case study is focused on a comparative analysis of the TCBO of a MCH (using natural gas heat) to a HPH (all electric) with passive house features. The tables below describe the construction features and costs of each home.

Summary

This case study compares a Minimum Code Compliant Home (MCH) that uses natural gas heat, to a High Performance Home (HPH) with passive house features. Our findings show that the average increase in initial cost for a HPH over MCH is typically only 4% to 10%. But when the total cost of home ownership is considered, the savings are:

- \$16,000 over 12-years (average time people own a home),
- \$84,000 over 25-years (the typical mortgage term) and
- \$375,000 over 60-years (the typical life of a home).

Background

Building owners, designers, or government economists, do not use a consistent method of determining the investment value and cost savings when it comes to investing in energy efficient and/or sustainable building features. The most common techniques used are simple payback, return on investment (ROI), or net present value (NPV). However, these parameters do not show the real value of HPH, and are often calculated over some arbitrary time period, such as 10 or 20 years, or over the useful life of a single building component. A better approach would be to:

- Evaluate the whole building, as opposed to a single component.
- Evaluate the useful life of the building, which could easily be 60-years. This period could be extended considerably by making the building more sustainable and durable.
- Determine the value by calculating the Total Cost of Building Ownership (TCBO). The TCBO is determined using the SEEFAR-Valuation<sup>®</sup> which includes all the costs of building ownership such as mortgage interest, utility costs, maintenance, GHG emission tax, property tax, insurance, etc.

It is important to understand that a High Performance Building is, "a building that integrates and optimizes all major high-performance building attributes, including energy efficiency, durability, life-cycle performance, and occupant productivity".<sup>1</sup> This definition is important because 'high performance' is more than just energy efficiency.

The Home Comparison Construction Features

Table 1 is a comparison of the home construction features of the MCH versus the HPH:

TABLE 1	Minimum Code Compliant Home (MCH)	High Performance Home (HPH)
Utility description summary	Natural Gas Heating	All Electric
R-value of above grade walls	R15.9	R60
R-value of attic space	R48	R100
R-value of below grade walls	R15.9	R52
R-value of foundation floor		R48
Area of conditioned space	1,700 ft <sup>2</sup>	1,700 ft <sup>2</sup>
Window type	Dual pane	Triple pane, Low E, Gas filled
Window area	17.2 m <sup>2</sup>	16.68 m <sup>2</sup>
Exterior door type	Two insulated steel	Two insulated fiberglass
Heating system description	Natural Gas condensing furnace	3350 watts of Electric baseboards
Cooling system description	Electric air conditioning	Sub-soil heat exchanger - 10 watt pump
Ventilation system description	HRV	High efficiency HRV
Water heating description	Electric glass lined steel tank	Electric fiberglass tank
Lighting description	CFL	LED
Appliance description	Electric	Electric

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Table 2 shows the initial capital cost of the homes. The first row shows costs of the components that affect energy consumption; this includes many of the items described in the construction comparison. The first row also shows that the HPH has an 18% higher cost for energy configuration construction.

The second row shows that the cost of non energy-related components were intentionally kept identical to eliminate the impact of differences in the preferences for how the home is finished.

The last row shows the total construction cost, which is only 8% higher for the HPH.

TABLE 2	Minimum Code Compliant Home (MCH)	High Performance Home (HPH)	Total Cost Differences
Energy-related construction costs	\$145,000	\$170,968	18%
Non energy-related construction costs	\$174,000	\$174,000	0%
Total Construction Costs	\$319,000	\$344,968	8%

There are additional inputs to the SEEFAR-Valuation<sup>®</sup> such as equipment cost, equipment life in years, energy costs and consumption, cost escalations, etc. These all have a bearing on the TCBO, but are not shown in order to simplify for this case study.

## Results

Table 3 shows the differences between the TCBO for the MCH and the HPH:

TABLE 3	Minimum Code Compliant Home (MCH)	High Performance Home (HPH)	Total Savings	Savings %
Greenhouse gas emissions (kg)	4,055	19	4,036	99.5%
Energy use index (EUI) (kWh/ft <sup>2</sup> /year)	18.5	3.8	14.7	80%
TCBO at 12-years	\$102,000	\$86,000	\$16,000	16%
TCBO at 25-years	\$268,000	\$182,000	\$84,000	32%
TCBO at 60-years	\$680,000	\$605,000	\$75,000	38%

The first row shows that the greenhouse gas (GHG) emissions are 99% lower for the HPH, since the electricity in Manitoba is generated from hydro, whereas the MCH burns natural gas.

The second row shows the Energy Use Index (EUI). The energy consumption is 80% lower for the HPH. This is important because utility rates are rising faster than inflation due to the addition of the carbon tax and aging utility infrastructure that is in need of renewal.

Rows three, four and five compare the TCBO over 12-years, the average time people own a home; 25-years, the typical mortgage term; and, 60-years, the useful life of the building.

Every building has its own unique characteristics that should be accounted for to optimize the investment value. The SEEFAR-Valuation<sup>®</sup> allows the user to optimize the selection of building components in terms of energy use and durability. This will help to lower the TCBO level.

How would the TCBO be affected by using more durable materials such as ceramic tile floors, metal roofing, or adding solar photovoltaic panels, etc?

A SEEFAR-Valuation<sup>®</sup> will help answer these types of questions in the most definitive way by monetizing the relevant benefits of each option.

1. The US National Institute of Building Sciences: <https://www.nibs.org/wqsp/06>

### A Cautionary Note on Case Study Conclusions

The SEEFAR-Valuation<sup>®</sup> demonstrates that the life-cycle variance in the total cost of building ownership (TCBO) between different designs for two similar homes can easily be in the six-figure range. Therefore, drawing "general" conclusions about the TCBO differences between any two home types can prove to be misleading. The same risk applies when drawing TCBO conclusions based on units of 'building area'.

As a matter of financial logic, homes that are more sustainable are more likely to have lower TCBO levels; larger homes are more likely to have higher TCBO levels; and, homes that reduce heat loss through high performance building envelopes can be expected to have lower TCBO levels than homes that offset heat loss through mechanical systems. For that reason, it is recommended that the SEEFAR-Valuation<sup>®</sup> assessment be conducted on each home design option being considered.

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Note. Adapted from *Manitoba Case Study*, by Wayne Cole, 2018, p. 38. Copyright 2018 by Sustainable Renewal Planning. Adapted with permission.

The installation of adequate insulation, metal roofing, and metal siding are all effective ways to reduce ownership costs. When installed correctly using a high-performance building methodology these building components may never need to be replaced for the useful lifetime of the building and require little to no maintenance. Insulating the building envelope reduces the energy requirements for heating and cooling, increases occupant health and comfort, and makes the building safe during short-term extreme temperature events or power outages. The reduction of heating and cooling requirements also allows for the specification of smaller and less costly equipment, which reduces construction costs, energy demand, and the cost of recapitalizing those systems at the end of their useful lifetimes. Additionally, high-performance building methods reduce moisture in the building envelope (the building's exterior walls and roof), protecting the structure from rot, which can lead to costly repairs (Serroukh & Hashemi, 2021). Metal roofing and siding components have a potential service life of over 60 years (Ryan, 2014) and can be recycled at the end of their lifetime. These components further protect the building envelope to minimize moisture infiltration and extend the lifetime of structural components.

In addition to Canada's National Building Code, several types of green building standards promise to increase building performance. It is fundamental to understand how the models work to gauge their potential to achieve high-performance results that meet expectations. The current recommended regulatory approach is to establish "absolute performance targets" (Passive House Canada, 2022, para. 4) that clearly outline the maximum allowable energy consumption and minimum allowable ratings of building components that must be met to achieve certification (Bernhardt, 2020). In contrast, the current National Building Code and some green building standards use "relative performance targets" (Passive House Canada, 2022, para. 4). Relative building standards compare a proposed building to a fictional reference building of the same design but built to the minimum allowable Code requirements. The proposed building is then determined to be a percentage better than the reference. This method has been discredited as an indicator of building performance and has led to a "building performance gap" (Bernhardt, 2020) where the actual building performance falls below the anticipated performance. The most stringent high-performance building standards use advanced modelling software that predict building performance based on multiple data inputs from the design specifications and absolute performance targets. The combination of these elements along with post construction testing and verification of critical assemblies guarantees that buildings perform to expectations which is key to achieving owner satisfaction.

Incorporating resilient building materials and high-performance building methodologies typically comes at a cost premium in the range of 7%-15% (Freeman, 2017). The COVID-19 pandemic has exacerbated building material prices related to high-performance and resilient measures adding to the cost premium. Cellulose is a common insulation material in high-performance wall systems and its price has increased almost 5% since 2019. Plywood air vapour barriers are another common feature of high performance wall systems and plywood is also used as a gusset system for a "Larson Truss" (Proven, 2014), a popular framing component used to make thick exterior walls. The price of sheet goods has increased dramatically since 2019 with 3/8" plywood seeing a 58% cost increase. The cost of sheet metal for roofing and siding has similarly increased 47% since 2019 (Proven, 2023). TCBO modelling, however, shows that upfront cost premiums are typically recovered within six years (Passive House Canada, 2022), though the pandemic's effect on material pricing has yet to be factored into TCBO models.

### ***Regenerative Economic Transition***

The ICA Statement of Co-operative Identity (ICA, 1995) outlines the values and principles that all co-operatives should embrace. The ICA has reassessed the *Statement of Co-operative Identity* approximately every 30 years to ensure the statement remains relevant to the global co-operative movement. As the current ICA statement was adopted in 1995, the 33rd World Co-operative Congress chose the theme of *Examining our Co-operative Identity* for the 2021 proceedings in preparation for re-examining the ICA Statement. In their discussion paper prepared for the congress, Wilson et al. (2021) described the current global changes and disruption that provide the context for a reassessment of co-operative values and principles such as: full digitalization of the global economy; greater access by girls and women to education and socioeconomic roles more traditionally associated with men; growing insecurity of employment for young people; rising mistrust of authority and growth of populism; worsening environmental degradation and climate emergency; aging of the population and declining birthrates in developed countries; and the effects of the pandemic (pp. 6-7). They noted that the seventh principle, *Concern for Community*, was created in 1995 to address such evolving challenges. The wording of this principle was chosen to align with the



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United Nations definition of sustainable development which is “[d]evelopment that meets the needs of the present without compromising the ability of future generations to meet their own needs” (ICA, 2015, p. 86). In light of the current state of global affairs, the re-assessment of the seventh principle should include a review of novel economic frameworks such as Doughnut Economics (Raworth, 2017a), which outline a necessary transition from mere sustainability to regenerative practices (Novkovic, 2020).

Earth Systems scientists have made it clear that if we do not take action in the next nine years we are potentially triggering a climate crisis that would lead to mass extinction (Friedlingstein et al., 2022). Building construction techniques that incorporate high-performance and resilient measures drastically lower greenhouse gas emissions emitted from building construction and operation to the point of potential reductive effects (Magwood, 2018).

The complexity of economic transition creates a challenge beyond the capacity of any individual organization (Wageningen Centre for Developmental Innovation, 2019). An MSN approach creates the potential for solving complex social and economic challenges to ensure humanity stays within the Doughnut (Leviton-Reid & Fairbairn, 2011; Raworth, 2017a, 2017b).

### *Housing Needs*

Households that spend 30% or more of their total income on housing costs are deemed to live in unaffordable housing. Manitoba’s rate of unaffordable housing was 17.3% in 2021 (Statistics Canada, 2022b). This was a drop of 1.7% from 2016, but the decrease is unlikely to continue as COVID-19 related benefits were a significant contributor to income over the past three years. The combination of record high inflation and the resulting government measures of increasing interest rates as well as the phasing out of pandemic benefits in 2022 will have drastic effects on the average shelter-cost-to-income ratio (Statistics Canada, 2022a, 2023).

Statistics Canada measures low-income in several ways. Using the low-income measure, after tax, which establishes a threshold based on median household income adjusted for household size, 15.9% of Winnipeg households, representing 109,540 people, met the low-income criteria in 2016. Using the low-income cut-off, after tax, which establishes a threshold based on the share of an individual’s or family’s income spent on housing, food, and clothing, 13.3% of individuals in private households in the Winnipeg Census Subdivision (CSD), a total of 91,940 people, met the low-income criteria in 2016 (Carter et al., 2020).

Social housing refers to housing units that have some form of subsidies in place. These housing units are predominantly owned and operated by Manitoba Housing, a branch of the provincial government, or in partnership with non-profit housing providers that receive subsidies and funding through Manitoba Housing. Social housing is specifically geared towards low-income families (Carter et al., 2020). End Homelessness Winnipeg estimates that between 67 and 193 additional social housing units need to be developed every year from 2018-2025 to meet the growing demand of low-income families (Kotyk, 2018). This mirrors the findings of Carter et al. that the lack of available affordable and social housing in Winnipeg must be addressed (2020).

### *Ownership Costs and Affordability*

Adequate Housing refers to units that “are not requiring any major repairs” (Carter et al., 2020, p. 156). In 2016, 24.8% of housing units in the Winnipeg CSD fell below adequacy standards. The number was much higher in the Centennial and Midland zones where 47.4% and 32.9% of housing units failed to meet the adequacy standards respectively (Carter et al., 2020). Winnipeg has an older housing stock than other cities with 34.5% of dwellings being built on or before 1960. Looking at housing adequacy by age, it is clear the older stock is falling into disrepair with 58.5% of housing built in 1960 or before needing significant repairs. In Winnipeg, the older dwelling units tend to be in the poorest neighbourhoods with the greatest need for low-income housing. The 2016 data suggests that the low-income housing stock is more likely to be built on or before 1960 and also more likely to fall below adequacy standards (Carter et al., 2020). The census data also shows that, year over year, more money is being spent on repairs and maintenance, with owner occupied dwellings in Manitoba increasing their expenditures by an average of 18.6% per year between 2011 – 2021 (Statistics Canada, 2022c, tbls. 34-10-0095–01). Landlord and tenant occupied dwellings similarly increased their expenditures 11% per year over the same period. This data could be affected by

pandemic income supplements and other pandemic related financial implications as the highest increase in spending by far occurred between 2020 and 2021 (Statistics Canada, 2022c, tbls. 34-10-0095–01).

In addition to repair and maintenance costs, factors such as energy prices, mortgage rates, rental rates, and home prices are outpacing income growth. From 2016 to 2023, Winnipeg household income rose 21.5% from a median of \$68,331 to a median of \$83,000 (Carter et al., 2020; Government of Canada, 2023). Between 2017 and 2022, Manitoba's electricity rates increased by 13.8% and the base rate increased 13.9%. From February of 2018 to August of 2022, primary Natural Gas prices in Manitoba increased by 159.4% (Manitoba Hydro, n.d.). From 2017 to 2023 the average home resale price in Winnipeg rose by 22.8% to an average price of \$349,490 and the average two bedroom rental unit rate increased by 22% to \$1350/month (Canada Mortgage and Housing Corporation, 2023; Canadian Real Estate Association, n.d.; Carter et al., 2020). In 2016, the average mortgage interest rate in Manitoba was between 2.08% and 2.3% but has since increased significantly to between 4.39% and 5.99% in 2023 (True North Mortgage, n.d.). Even though these interest rates are still historically low, the cost of housing in Winnipeg makes it difficult to move from rental tenure to ownership tenure (Carter et al., 2020). These data points show that the TCBO in Winnipeg is steadily increasing disproportionately to income, which will further increase the number of families that experience unaffordable housing or meet low-income criteria. New affordable housing developments should thus aim to reduce TCBO through the implementation of high-performance and resilient building methods.

### *Housing Affordability Programs*

Several incentives are available to help reduce the cost of constructing energy efficient buildings. Efficiency Manitoba is the provincial body responsible for sustainability programs and currently has two incentives for commercial or institutional buildings. The first is a \$2 per square foot rebate that only requires buildings to perform 5% better than the Manitoba Energy Code (Efficiency Manitoba, n.d.). The cost reduction provided by this incentive is minimal, representing between < 1% and < 2% of the hard construction cost per square foot of a multi-level multi-unit building (Altus Group, 2018). The second incentive provides up to \$10,000 to cover the cost of energy modelling for new builds (Efficiency Manitoba, n.d.).

The City of Winnipeg has developed the Affordable Housing NOW (AHN) program offered in partnership with Canada Mortgage and Housing Corporation's (CMHC) National Housing Strategy. Eligible projects have access to two funding options. The first is a Tax Increment Financing program which offers approved projects up to an 80% reduction in incremental property taxes for either 15 or 25 years based on the project's attributes. Projects located in the Downtown area or a designated Housing Improvement Zone and owned by non-profits or Indigenous governments are eligible for the 25-year program. The second funding option is a Capital Grant that is awarded on a merit-basis to projects that vastly exceed the minimum project requirements. The Capital Grant provides \$10,000 per affordable housing unit to a maximum of \$250,000 in total project funding for projects that are owned by a non-profit or Indigenous government. The buildings must also offer at least 50% of units at affordable housing rates which are defined as being 60% of the median market rate and also offer an undetermined number of housing units at income-tested rates and rented to low-income households per the Manitoba Housing Social Housing Rental Program Income Limits (City of Winnipeg, n.d.). AHN has another incentive program offered to non-profit low-income housing providers where city owned surplus lots can be purchased at 50% of their assessed value. The AHN has earmarked six surplus lots to be made available for \$1 provided that the housing units are constructed to a Net Zero emissions standard (Raddatz, 2022).

In addition to the AHN programs, CMHC also offers the National Housing Co-Investment Fund, which provides access to affordable and forgivable loans to help with affordable housing construction projects. The fund requires a partnership between some level of government and either non-profit or private sector partners focusing on projects geared towards mixed-income, mixed tenure, and mixed-use including affordable housing. Eligible projects must be energy efficient with a requirement to "achieve a minimum 25% decrease in energy consumption and Greenhouse Gas emissions outlined in the requirements of the 2015 National Energy Code for Buildings . . . or a 15% decrease relative to the 2017 National Energy Code" (Canada Mortgage and Housing Corporation, n.d.).

Housing Partnership Canada is a lending institution dedicated to affordable housing development in Canada. Housing Partnership Canada created the Housing Investment Corporation (HIC) with support from CMHC's Affordable

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Housing Innovation Fund to assist non-profit and co-operative housing providers in accessing capital markets through an institution that understands affordable housing development. The HIC is “a sector-based financing vehicle . . . provid[ing] expertise in housing development and regeneration, finance, and underwriting required to bridge the gap between housing providers and debt investors” (Housing Investment Corporation, 2023a). The HIC offers low-cost financing including 30+ year fixed rate loans, low administration fees, and financial and housing knowledge and expertise to assist with development projects (Housing Investment Corporation, 2023b).

### *Passive House*

The Passive House Institute (PHI) is an internationally recognized voluntary building certification organization that promotes the Passive House Standard for energy-efficient buildings, setting the criteria and guidelines for energy-efficient buildings. PHI set an exceptionally high absolute performance target for their standard, resulting in a 90% reduction in primary energy use compared to conventionally constructed buildings. The approach embraces a holistic model that views a building as a system of interdependent components working together to achieve a high-performance outcome (International Passive House Association, n.d.). The PHI standard incorporates the following principles of high-performance buildings (first developed by Saskatoon engineer Harold Orr) (Hough, 2018, para. 7).

- Measure where energy leakages occur in houses.
- Minimize the waste of energy.
- Educate builders on how to build and retrofit houses to an acceptable energy standard.
- Develop computer modelling software to design energy efficient homes prior to construction.

PHI offers three main categories of building standards including PHI for new builds, EnerPHit for retrofits, and PHI Low Energy Buildings for new builds that do not meet the requirements for PHI certification yet still meet a high-performance threshold. Attention to conservation and minimizing energy loss helped to determine the “[g]eneral minimum criteria for all standards” (Passive House Institute, 2023, p. 13), which contribute to lowering the cost of building construction and increasing energy efficiency. The concepts include:

- Frequency of overheating – the building must be designed to stay cool in summer either by shading and thermal insulation or with properly sized active cooling equipment.
- Frequency of excessive humidity – interior humidity must be maintained below 60% to avoid mould growth.
- Minimum thermal protection – two factors are considered: hygiene and comfort. The hygiene criteria ensures that no condensation forms on any interior surface to remove the possibility of mould growth. The comfort criteria ensures that adequate insulation is installed using a thermal bridge free design so that interior surface temperatures remain within allowable limits.
- Occupant satisfaction – this section covers many of the systems that contribute to occupant comfort such as: operable windows, user-operated lighting control, user operated temperature control, adequately sized and controllable ventilation systems, measures to address low humidity, sound reduction measures to reduce ventilation noise, and ventilation duct placement to remove draughts. (Passive House Institute, 2023)

Another feature of PHI design is building form factor, which aims to maximize interior volume while minimizing wall area. The optimum shape for a building and the baseline for PHI design is a cube, an easy-to-build shape with the maximum interior volume per exterior area. PHI building criteria work in conjunction to drastically reduce TCBO and construction costs by reducing the energy required to operate the building throughout the year and protecting the building from humidity and temperature fluctuation that can harm building components. The resulting buildings are inherently more sustainable, cost effective, and resilient than conventionally built homes due to the focus on reducing energy consumption using passive systems.

The cost of building ownership is increasing due to both economic and environmental factors. This is leading to a growing population for whom housing costs are becoming impossible to manage. While the initial cost of incorporating high-performance and resilient building measures does exceed that of conventional construction, these elements permanently reduce TCBO, which can lead to large savings for building owners. They also provide



additional safety, security, and comfort to occupants and reduce operational greenhouse gas emissions compared to code-built buildings, making their implementation a clear benefit to future generations.

## Literature Review

### *Multi-Stakeholder Networks*

A business network is a group of companies directly or indirectly connected by social or economic ties. Their relationships are built through “repeated exchanges” (Öberg, 2019, p. 124) where companies learn from, adapt to, and invest social and financial resources in each other. Business networks are known for innovation and creating new ideas (Öberg, 2019). A Multi-Stakeholder Network is a complex business network strategy implemented by co-operative enterprises. MSN’s can be comprised of only co-operatives or can extend membership beyond co-ops to other business forms (Martins Rodrigues & Schneider, 2022). Co-operatives that exist in co-op dense areas are likely to exhibit a very high degree of strategic networking that provides necessary support including financial, technical, and human resources in both start-up and growth stages of co-op development. Networks enact innovations and expose co-ops to better access to goods and services (Girard & Langlois, n.d.; Mezani & Zamangi, 2010; Novkovic & Holm, 2011).

Stakeholders are “groups or individuals that can significantly affect or are significantly affected by an organization’s activities” (Harrison & St. John, 1996, p. 47). They can be categorized as being primary or secondary, where the former has a direct relationship with the organization and the latter is representational. MSNs can be formed with varying stakeholder structures and their exchanges revolve around “social interactions” towards a “highly focused purpose” (Martins Rodrigues & Schneider, 2022, p. 32) allowing the MSN to leverage the skillsets of their various stakeholders to fulfil social and economic goals (Eikelenboom & Long, 2022; Leviten-Reid & Fairbairn, 2011; Martins Rodrigues & Schneider, 2022; Novkovic & Holm, 2011). MSNs are unique from other forms of co-operative networks as they are not governed by an apex organization but rather come together as a group of autonomous organizations that can include non-co-operative entities “operate[ing] relatively independently of other stakeholder groups, while taking advantage of particular synergies” (Martins Rodrigues & Schneider, 2022, p. 32).

Freundlich observes that MSNs typically organize in three different ways:

- Creation of common institutions and policies tailored to their needs, providing access to goods and services that the conventional market fails to provide.
- Firm-to-firm collaboration seeking business synergies and economies of scale.
- Coordination of business activities and strategic alliances. (Freundlich, 2015)

Some economics-based management theories view humans as “utterly self-serving, interested in maximizing immediate utility only” (Pirson & Turnbull, 2011, p. 102) ignoring the potential for stakeholders to interact as partners. They suggest that due to the heterogeneous nature of stakeholders, decision-making will be costly and inefficient leading to the eventual demise of the MSN (Leviten-Reid & Fairbairn, 2011; Roloff, 2008). From the perspective of these theories, stakeholder involvement must be carefully managed to mitigate the potential for stakeholders to cause harm to the organization or contribute to environmental uncertainty (Harrison & St. John, 1996; Roloff, 2008). Empirical research tends to disprove these theories showing instead that MSN actors can be more invested in collective ambitions over individual interests, following a humanistic paradigm in which “human beings are not maximizing their own utility, but balancing the interests of themselves and people around themselves in accordance with general moral principles” (Dierksmeier & Pirson, 2008; Hauser, 2006; Lawrence, 2010 in Pirson & Turnbull, 2011, p. 103). The focus on collective ambitions allows for efficient and focused decision-making and problem solving using innovative organizational forms to achieve economies of scale and agility in an evolving environment (Harrison & St. John, 1996; Leviten-Reid & Fairbairn, 2011; Martins Rodrigues & Schneider, 2022; Novkovic, 2014; Novkovic & Holm, 2011; Roloff, 2008).

Group interactions demonstrating reciprocation and honest communication fulfill basic human psychological needs (Perkins, 2015; Sacchetti & Tortia, 2014) and form the basis of trusting relationships that are essential for cooperation and humanistic governance (CME SMU, 2021; Martins Rodrigues & Schneider, 2022; Roloff, 2008; Sacchetti & Tortia, 2014). MSNs are created through these interactions where common values are established with

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a shared “vision of something bigger” and a focus on stewardship (Lund, 2021, p. 6). MSNs have been categorized as “platforms for deliberative democracy” that “facilitat[e] learning and collaboration” and serve to create innovative solutions to social issues (Roloff, 2008, pp. 243, 244).

The governance of MSNs closely aligns with the features of the co-operative enterprise model such as democratic decision-making, joint ownership and control, and people centredness (Miner & Novkovic, 2020). As such, all stakeholders can create and review the rules that govern the MSN, which also creates trust and a sense of ownership between stakeholders.

The diversity and heterogeneity of stakeholders lead to good governance where “divergent opinions” are treated as assets (Langlis & de Bertoli, 2006, as cited in Leviten-Reid & Fairbairn, 2011) and can lead to the uncovering of novel perspectives (Eikelenboom & Long, 2022). The context and lived experience of each stakeholder affects the decision making process overcoming the individual’s inability to “peer outside of the linguistic fabric in which we find ourselves and our cognitive domains braided” (Espinosa et al., 2007, p. 334). Governance systems are typically deliberative and direct at the development stage but shift to constantly evolving systems as environmental changes and opportunities arise or when the needs and goals of stakeholder members shift over time (Novkovic & McMahon, 2023). Novkovic and McMahon (2023) cited Ghoshal and Morgan (1996) and Simon (1979) in posing that organizations can be seen as the product of the “human inability to fully process information under conditions of complexity and uncertainty” (p. 22). The complexity of global issues surrounding sustainability and development have moved beyond the capacity of any single entity’s ability to solve; therefore, a multi-stakeholder organizational approach is required (Wageningen Centre for Developmental Innovation, 2019).

The literature shows that polycentric governance models are ideal for MSN governance as they incorporate accountability and mutual support instead of agency theory models or economics-based management theories built on mistrust. Polycentric models use a systems-based approach that breaks down complexity into smaller and more manageable nodes of independent decision-making incorporating democratic processes to govern towards their shared ambition. This power distribution allows for transparency and checks and balances within the system while reducing transactional costs due to the alignment of the organization’s goals and the blurring of separation between management and governance roles. These features of polycentric governance can reduce both group and individual bias and help reduce the burden of overwhelming information faced by more homogenous organizations. MSN governance is a marked shift from traditional rigid agency and economic theory-based systems that view humans as opportunistic and requiring control to avoid self-serving behaviour. The humanistic foundations of MSN governance lead to structures that are diverse and draw on the lived experience of stakeholders to meet human needs and promote human dignity (Martins Rodrigues & Schneider, 2022; Novkovic, 2014; Novkovic & Holm, 2011; Novkovic & McMahon, 2023; Novkovic & Miner, 2015; Roloff, 2008; Turner & Wills, 2022).

Trust has been established as an essential mechanism in stakeholder relationship development to facilitate cooperation (Massaro et al., 2019, as cited in Martins Rodrigues & Schneider, 2022; Roloff, 2008). Trust is built on societal and institutional norms and reciprocity that is further supported by shared values and principles such as the ICA statement of co-op identity (Bachmann & Inkpen, 2011; Girard & Langlois, n.d.; Leviten-Reid & Fairbairn, 2011; Martins Rodrigues & Schneider, 2022). Trust allows more flexible formal agreements and reduces the need for highly-complex legal mechanisms of control (Martins Rodrigues & Schneider, 2022; Novkovic, 2014). Institutions like co-ops can act as facilitators of trust where they leverage behavioural norms, reputations, and codes of conduct such as the ICA statement to act as “third party guarantor[s]” that reduce the risk of investing in a trust relationship (Bachmann & Inkpen, 2011, p. 285).

Bachman and Inkpen (2011) identified the need for contractual agreements and “reliable contract law” (p. 289) when dealing with multiple stakeholders, while other researchers have advised against the “formalization and monitoring of contractual agreements” (Harrison & St. John, 1996, p. 58) as they can reduce trust and create conflict. Martins Rodrigues and Schneider (2022) identified in their case study of the Namasté Solar Network that partnerships were originally developed through informal relationships and alliances that grew into more formal arrangements for co-op-to-co-op business. They noted that the Namasté Network focused on fostering a shared culture beyond “structural ties” to connect the stakeholders (p. 47). Sacchetti and Tortia (2014) noted that the

inclusion and participation of diverse stakeholders serves to build trust and reduces conflicts which can help to overcome “contractual failures” (p. 68). The level of complexity of contractual frameworks for network coordination and control mechanisms depends on the understanding of stakeholders as partners for reciprocal information and knowledge sharing or as contributors to environmental uncertainty requiring careful management.

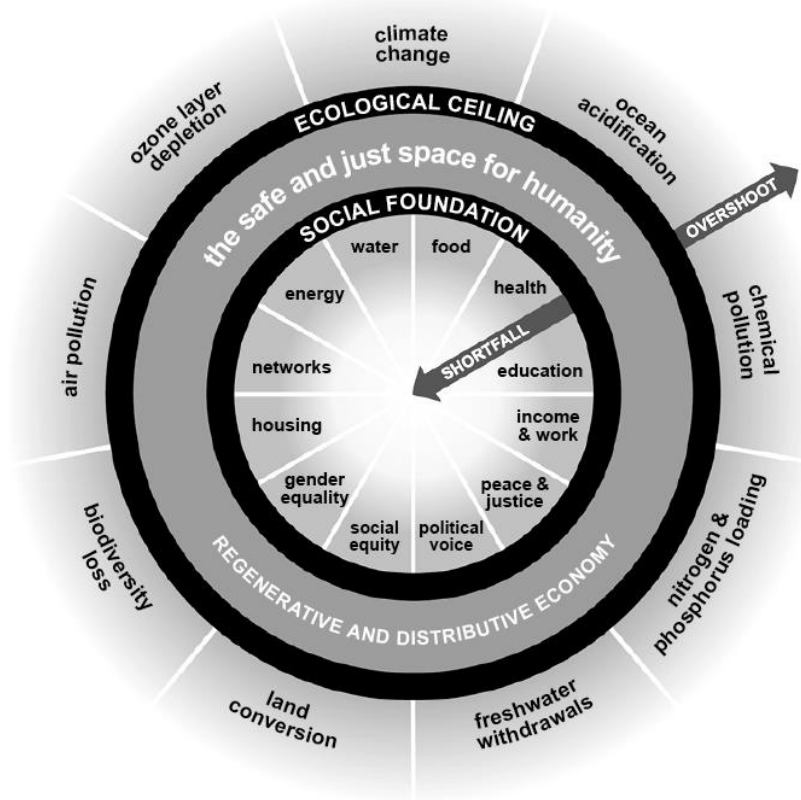
An MSN approach to tackling affordable housing is a good fit as MSNs are often formed to address social issues. An MSN that includes a diversity of stakeholders, each with a specific contribution toward low-income housing development, should allow for novel approaches to tackle the initial cost of incorporating high-performance and resilient building measures in low-income building projects. If the MSN is created with co-op and SE members, then the potential for reduced transactional cost should be more easily realized due to common values and principles and an alignment of goals.

### *Doughnut Economics*

The MSN proposed in this project aims to address social and ecological issues. Current affordable housing projects in Winnipeg must meet high-performance building standards, while high-performance building projects must incorporate adequate, affordable housing units. Addressing these issues through an MSN requires appropriate performance indicators to ensure the organization’s economic activity meets expectations regarding the convergence of social and sustainability components. The Doughnut Economics (DE) framework created by economist Kate Raworth establishes social and ecological thresholds that all economic activity must operate within to change the global economic system to a more humanistic model described as “meeting people’s needs without disrupting biophysical processes” (Turner & Wills, 2022, p. 1). Raworth has identified three major flaws in the current economic system: ecological context, work, and inequality. The current economic system requires constant Gross Domestic Product (GDP) growth, which ignores ecological limits (Raworth, 2017a). Inequality is increasing, creating a greater divide between the richest and poorest, a problem the current economic system intensifies (Ross, 2019). Economic theory states that the worsening inequality is inherent to our economic system, but that growth will eventually correct it. Raworth has countered this theory stating that inequality is a design flaw and that many options exist to redistribute wealth to those who help create it (Raworth, 2017b).

In response to the failures of our current economic system, Raworth has proposed the DE model, shown in Figure 2, which visually represents the social and ecological constraints the global economy must operate within to create a “safe and just space for humanity” (Raworth, 2017a). The social constraints, identified in the inner ring of Figure 2, were developed by Raworth in 2011 while working for Oxfam and consist of twelve basic human needs that no person should go without. The social constraints are also part of the United Nation’s Sustainable Development Goals established in 2015 (Raworth, 2017a).

**Figure 2: The Doughnut Economics Model**



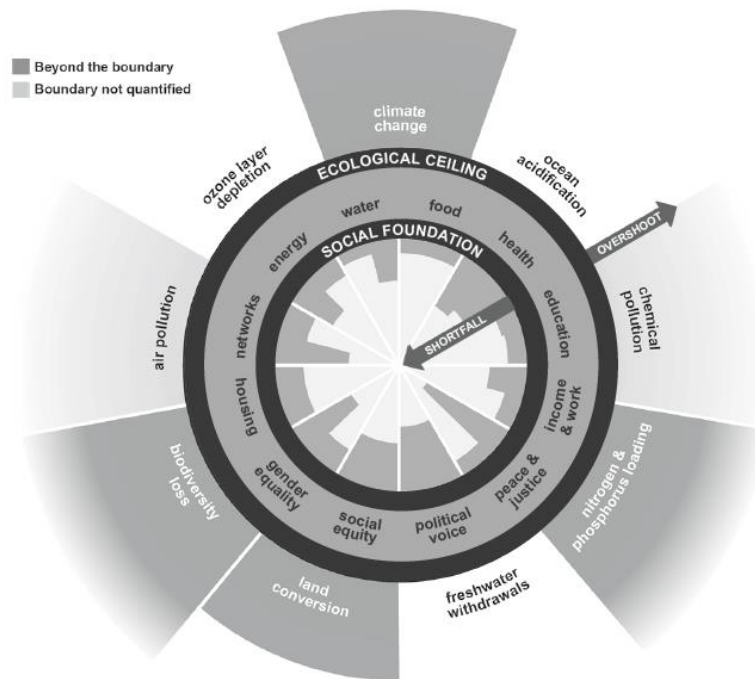
Note: Adapted from *Doughnut Economics* (p.38), by Kate Raworth, 2017, Copyright 2017 by Kate Raworth.

On the other hand, the nine ecological constraints shown in the outer ring of Raworth’s Doughnut relate to the processes identified by scientists as critical to maintaining stable climate conditions. Global economic activity is now “the single biggest driver of planetary change” (Raworth, 2017a, p. 41) and the DE model enables a better assessment of the social and environmental impact of economic activity at various scales from global to local to ensure that humanity can find a “dynamic balance” (Raworth, 2017a, p. 45) and thrive.

Scaling sustainability models, from global to local, has its challenges. Turner and Wills (2022) acknowledge the probability of novel issues in implementing the Doughnut: “Though planetary boundaries were not designed to be downscaled, translating their meaning to sub global scales is important to align with decision-making processes” (p. 2). They go on to note the work comes with technical challenges and “also raises normative questions about tolerance to risk in approaching biophysical thresholds, which may vary across contexts, as well as historical justice issues relating to inequities in past resource use” (p. 2). The authors also recommend “absolute rather than relative performance in relation to social and ecological goals, demanding a holistic approach that reflects and responds to the ways in which places are implicated in sustainability challenges” (Turner & Wills, 2022, p. 3). The challenge then becomes striking a balance between scientifically established thresholds and locally relevant and acceptable goals, which requires the integration of multiple stakeholders to provide the contextual information needed to establish local performance targets. The authors recommend a polycentric governance approach which allows for “adaptive and reflexive governance” (Turner & Wills, 2022, p. 6) built on collaborative relationships and shared goals.

As of 2017, social and ecological thresholds in many areas have been exceeded as shown below in Figure 3. Ecological boundaries have been overshoot in climate change, chemical fertilizer loading, biodiversity loss, and land conversion. There are also shortfalls in every single social category “limit[ing] the potential of so many people’s lives in the twenty-first century” (Raworth, 2017a, p. 43). Raworth has noted that this generation is the first to understand humanity’s effect on the natural world and likely the last with any chance to change course. A logical first step towards change is assessing all current and proposed economic activity per the DE framework to ensure opportunities are created for future generations instead of liabilities. According to Cook (2018), the second phase of the co-operative life cycle includes establishing co-operative health metrics. The DE model should be included as part of the assessment of all co-ops to ensure their activity falls within the doughnut.

**Figure 3: Global Economic Assessment**



Note. Global Economic Assessment using the Doughnut Economics Model, Adapted from *Doughnut Economics* (p.44), by Kate Raworth, 2017, Copyright 2017 by Kate Raworth.

### Multi-stakeholder Network Prototype and Research Methodology

#### *Multi-stakeholder Network Concept*

As a founding member and current Vice President of a high-performance builder’s co-operative in Winnipeg, I worked with my colleagues to devise a prototype MSN to examine the feasibility of creating such a network in Winnipeg, Manitoba. Our initial study does not focus on financial viability but on the potential for building the organizational network. The co-operative’s direct and indirect experience in working within the local construction sector helped to identify the following five stakeholder organizations that would be the key contributors of skills, knowledge, and expertise and form the initial membership base:

- low-income housing providers



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- lenders
- general contractors
- material suppliers
- high performance building specialist

We propose that a critical criterion for all stakeholders would be that they use either co-operative or Social Enterprise (SE) incorporation models to ensure shared values and principles and allow for the implementation of Principle Six – Cooperation among Co-operatives (ICA, 1995). The preference for co-operative and SE stakeholders should foster the development of co-operative networking innovations due to their shared values and principles (Novkovic, 2014; Novkovic & Holm, 2011). Adding SE stakeholders would also give the MSN access to grants and charitable donations only available to SE organizations. Each stakeholder should also have some vested interest in low-income housing, whether through their business operations or through their mission and vision statement, as MSN literature shows that a shared goal is required to align the network (Martins Rodrigues & Schneider, 2022). The following section describes the hypothesized potential contributions of each stakeholder with reference to unique capabilities and features of potential stakeholders in each category.

### Low Income Housing Providers

In Winnipeg, most low-income housing units are owned and operated by Manitoba Housing, which administers the government of Manitoba's Social Housing Rental Program. Other units are owned and operated by non-profit housing providers supported by the Manitoba Non-Profit Housing Association (MNPFA), or by private market rental housing (Kotyk, 2018). The rental program uses a rent-geared -to-income system where a tenant's rent is based on their gross household income. The difference between the tenant's rent and the market rate is paid by the provincial government to non-profit and private market rental housing providers via a subsidy administered by Manitoba Housing (Province of Manitoba, n.d.). As one of the goals for our MSN is to lower the upfront and operational costs associated with low-income housing, we included a Non-Profit Housing Provider (NPHP) based on the hypothesis that an NPHP could act as a developer for both single-family and multi-family low-income housing projects. We also hypothesized that an NPHP would then act as owner/operator of the building once completed. An institution like MNPFA could facilitate trust building between the MSN and MNPFA members.

### Lenders

Obtaining project financing for low-income housing development is challenging. The pre-construction phase of development can be costly and without flexible and affordable lending products projects can be delayed or even abandoned. The development of low-income housing units therefore requires a lender committed to supporting low-income housing projects. Credit unions in other Canadian provinces have already implemented programs to support low-income development and environmentally friendly consumer choices. For example, Vancity Credit Union in British Columbia established an Affordable Housing Accelerator Program and Fund which supports non-profit, Indigenous, and co-operative housing organizations through the pre-construction process of low-income housing development by providing grant funding, affordable low-cost loans, and development training and advice (Vancity, n.d.). We hypothesize that a Manitoba credit union could provide the same type of low-income housing development programming that Vancity offers.

Providing impact investment is another tool lenders could offer the MSN to support its goals. Impact investments are defined as "investments made into companies, organizations, and funds to generate a measurable, beneficial social or environmental impact alongside a financial return" (Wikipedia, 2023a). Assiniboine Credit Union (ACU) in Winnipeg has developed grant and sponsorship programs to support organizations involved in community enterprise development and environmental sustainability (ACU, 2022b). ACU's Manager of Environmental Sustainability has indicated in personal conversation that they would be willing to create pilot mortgage programs to incentivise high-performance buildings.

### General Contractors

A General Contractor (GC) is typically required to manage the construction of complex building projects. The GC would be responsible for supervising building construction including supervising the jobsite and managing sub-contractors. An ideal GC stakeholder in the MSN would already be involved in developing low-income housing and

have experience in high-performance and resilient construction methods. The GC should be familiar with Integrated Project Delivery, which mirrors the MSN model in that “all disciplines in a construction project work as one firm . . . where the entire building team including owner, architect, general contractor, building engineers, fabricators, and subcontractors work collaboratively throughout the construction process” (Wikipedia, 2023b, para. 3). Integrated Project Delivery processes have been shown to reduce cost overruns due to mistakes and miscommunication, reduce waste, reduce conflict between stakeholders, and increase product quality (Wikipedia, 2023b). The GC should also be familiar with high-performance building standards like PHI to reduce the cost of training in high-performance building methodology. Purpose Construction (PC) in Winnipeg is a non-profit social-enterprise GC that has recently started developing single family low-income housing units. PC’s social enterprise incorporation model allows them to access charitable donations and other public and private funding to develop low-income housing and implement energy efficient building construction methods. PC has already taken steps towards increasing the efficiency of their homes including the training of their workforce as PHI certified tradespersons.

#### Material Suppliers

Construction projects require a reliable supply of appropriate materials and delivery coordination to ensure the construction process can proceed without delay. Due to the issues of embodied carbon, Material Suppliers (MS) need access to local organic based materials to minimize the building’s lifetime carbon emissions. We hypothesize that an MS that uses a co-op or SE incorporation model can serve to reduce transaction costs (Borzaga et al., 2011) which could help the MSN reduce construction costs. Federated Co-ops Ltd. (FCL) supports multiple consumer co-ops around Manitoba which often provide lumber and building material sales. Although none are located within the City of Winnipeg, Homestead Consumers Co-operative Ltd (HCC) operates out of Portage La Prairie, Manitoba, a smaller city located just under 85 kilometers to the west. As Winnipeg is the major distribution hub in Manitoba, HCC owns warehouse space in the city and can ship most materials directly from their distribution centre, which reduces delivery costs. FCL also administers a Community Investment Fund and Co-op Community Spaces Program. The MSN could access these grant programs through one of the non-profit stakeholders.

#### High Performance Building Specialists

High-performance buildings must be carefully designed, built, and tested to optimize energy efficiency. A High-Performance Building Specialist (HPBS) would assist in the design and development and perform energy modelling on low-income housing to ensure that important elements like the building form factor and intersection details are optimized to maximize efficiency at the lowest possible cost premium (Bernhardt, 2020). Using a system like PHI with its absolute performance targets establishes a clear expectation for the GC to meet. The HPBS team should include PHI certified design consultants familiar with PHI design and construction to ensure the project meets performance expectations. The HPBS team would also oversee and provide quality control for the installation of critical assemblies, provide trades training to the GC, conduct the required performance testing, verify that assemblies have been constructed to design specifications, and provide final analysis and submit certification documentation for the projects to ensure that performance targets have been met.

#### *Research Methodology*

To determine the feasibility of creating an MSN to develop low-income housing using high performance and resilient building standards, we followed the methods and definitions below:

- High performance buildings meet Passive House International’s Low Energy Building Standard which requires that the building use less than 30kWh/square meter of treated floor area for heating demand and achieve a pressurization test result of less than 1 air change/hour at 50 pascals of pressure (Passive House Institute, 2023).
- Resilient building features are made of durable materials that have a longer average service life and can be easily repaired or replaced. Resilient materials should also be recyclable at the end of their useful lifetime, have a low embodied carbon designation, and be organically based wherever possible to facilitate the sequestration of carbon within the building (Magwood, 2018).

Based on those parameters, market research in the form of a questionnaire was distributed to stakeholders with the capacity to make critical contributions to support the goals of the MSN. We included five core stakeholders for this

## Multi-Stakeholder Networks: Developing High-Performance Low-Income Housing within the Doughnut

initial study and sent the questionnaire to individual representatives within each stakeholder group, noting that this is not an exhaustive list of potential stakeholders. To narrow down our initial choices, we first identified which core stakeholders would be required to perform fundamental functions within the MSN. Then, we developed a list of criteria that each stakeholder should meet based on the ICA statement of Co-operative Values and Principles to optimize relationship building and create the potential for innovative collaboration.

The questionnaires, attached as the Appendix, were designed to reflect the initial function or role expected of each selected stakeholder based on their current work in Manitoba and additional contributions identified by themselves. The data from the questionnaires were analyzed using qualitative methods to assess the feasibility of the proposed MSN.

Secondary data from the literature review helped build the description of the MSN in the questionnaires to provide context for the applicability of an MSN in addressing a complex social need like low-income housing. Additional public data, summarized earlier in the Background section, provided insight into homeownership trends in Manitoba, quantifying the changing costs of homeownership, and determining the demand for low-income housing development in Winnipeg. SEEFAR Building Analytics data was incorporated to show the effect of high performance and resilient building methodologies on TCBO. Federal, provincial and civic programs to aid in reducing the upfront build cost were also identified. Using the combined data, we have highlighted the benefits of investing in high-performance and resilient building methodologies for low-income housing and the potential for reducing the upfront cost through government programs and innovative stakeholder contributions. The circular economy concept of DE has been presented as context for why sustainable and regenerative economic models are needed to prevent our economic activities from causing the collapse of critical environmental and social systems. The DE model describes a pathway towards a more humanistic and distributive economic system.

Our study has been limited to a small sample of specific stakeholders in Winnipeg that may be unique in their combination of purpose and capacity which may lead to difficulties in replicating the MSN in other locations. Future research considerations should include identifying other stakeholder groups that could contribute to the MSN's goals.

### Analysis and Discussion

This section evaluates the results of the empirical market research conducted through stakeholder questionnaires and discusses the participation of specific stakeholders from each group.

#### *Questionnaire Results*

Themes emerging from the questionnaire responses include:

- Unanimous interest in joining the MSN
- An alignment of the goals of the MSN and their respective organization's mission and vision
- Confirmation of the possibility of partnership with other co-ops or SE
- Support for contractual requirements
- Interest in business networking
- The potential for time constraints to limit each stakeholder's ability to meaningfully participate in the MSN

The following section describes each individual organization and details their responses.

#### **Manitoba Non-Profit Housing Association**

Based on its current work in Manitoba, we identified MNPHA as the "Low-income Housing Provider" stakeholder. MNPHA is a local association representing over 100 non-profit housing providers in Manitoba. Their vision statement references sustainable and affordable housing, and their mission is to support non-profit housing providers in creating an affordable housing sector that achieves economic, social, and environmental sustainability. MNPHA supports their membership by developing programs and services including professional development, knowledge exchange through networking and conferences, and sector advocacy through the engagement of governments, stakeholders, and funding providers on behalf of their membership. MNPHA bridges the non-profit housing sector

with other organizations that support “resilience, relevance, and innovation” (Manitoba Non-Profit Housing Association, 2023). MNPHA indicates that as a representative association they would play an advisory and advocacy role in the MSN. They identified that a partnership with the MSN would allow MNPHA’s members to connect with high-performance building experts to assist in construction and renovation programs to increase building performance and provide additional resources to help overcome challenges they face in fundraising to incorporate high-performance building standards into their developments. MNPHA suggested they could advocate for the development of high-performance building incentive programs with various levels of government and program funders. They would also help to identify NPHPs that support the incorporation of high-performance and resilient building methods into low-income housing development which forms the shared goal of our MSN concept.

MNPHA identified potential issues that NPHPs would face in participating in the MSN. To meet funders’ requirements, NPHPs often prioritize short term affordability over long-term TCBO savings. The competing priorities of funders and NPHPs could create challenges in securing funding to cover the cost premium of high-performance and resilient measures. Due to Winnipeg’s relatively small affordable housing sector, finding enough MSN members to maintain momentum may be challenging. MNPHA indicated that although it can facilitate network development, it cannot evaluate business partnerships or make business recommendations to its membership. Still, MNPHA would connect organizations it felt could benefit from each other’s expertise and could act as a facilitator of institutional trust. Due to their advisory role, MNPHA indicated they would not require any formal contractual agreement with the MSN.

#### Assiniboine Credit Union

As the representative of the “Lenders” stakeholder group we identified a potential partnership with ACU, a 75-year-old credit union based in Winnipeg with seventeen branches located around the city. ACU’s vision is “a world where innovative financial services in local communities contribute to a sustainable future for all”. Its mission is “providing financial services for the wellbeing and resilience of our members, employees, community, and environment” (ACU, 2022a). ACU outlined their main contributions as follows:

- providing access to capital where funding gaps exist
- governance and management training for governance leaders within the MSN
- lobbying government and key stakeholders such as appraisers and developers

Partnering with the MSN would help ACU fulfill their mission by investing in local initiatives that benefit people and the planet and accomplish their mandate to support the development of safe and affordable housing. ACU recommended that the MSN should develop relationships with the public sector to access existing low-income housing funding programs. ACU indicated that the contractual level they would require to participate would be a simple Memorandum of Understanding (MOU).

#### Purpose Construction

As a representative of the “General Contractor” stakeholder group we identified PC, a non-profit SE already involved in the construction of single-family low-income housing in Winnipeg. PC has implemented a strategic plan to upgrade its affordable housing work to meet high-performance building standards and already has an MOU with Sun Certified Builders Co-op (SCBC) for training services on high-performance building methods.

PC is also developing a relationship with the Jubilee Fund in Winnipeg to develop novel affordable homeownership models such as rent-to-own. They are also collaborating with a trades training program run by Corrections Canada that operates a prefabrication plant for building components. Corrections Canada has indicated interest in developing a high-performance prefabricated wall system but needs assistance in training and technical capacity to implement their plan. PC acknowledged that they have faced challenges in trying to meet Efficiency Manitoba’s New Homes Program requirement of 20% better energy performance than code at a price that met affordable housing criteria. However, they proposed that the novel concept of the MSN and the potential training opportunities provided by the partnership could serve to increase the social impact of the projects, which could be attractive to current and future funding bodies.

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### Homestead Consumers Co-operative

Representing the “Material Suppliers” stakeholder group, we identified HCC. This organization operates Co-op Home Centre, a building supply consumers co-operative, and is a member of the Co-operative Retailing System run by FCL. HCC’s mission and vision include enhancing community life by building relationships, working together, leading in service, and positively impacting communities. Joining the MSN and participating in developing high-performance and resilient low-income housing would fit the HCC’s mission and vision and fulfill their commitment to Corporate Social Responsibility. In addition to acting as MS for building projects, HCC indicated that they could provide an advisory role and participate as steering committee members. They also have valuable experience in the building industry which they would bring to the MSN. HCC also indicated that they would benefit from enhancing the technical expertise of their own staff at their Home Centre locations and by expanding their business network. As their area of operation is mainly in Portage la Prairie and the surrounding area, HCC acknowledged that they would prioritize supporting projects in their home community and not necessarily those in Winnipeg.

Time commitments were indicated as a potential barrier to HCC’s participation in the network. FCL, the apex body that supports HCC, has several community investment programs that provide sponsorship and donations to non-profit organizations and community projects. HCC indicated that the MSN could qualify to receive support from FCL’s existing programs.

### Sun Certified Builders Co-operative

Representing the “High Performance Building Specialist” stakeholder group we identified SCBC, a multi-stakeholder co-op based in Winnipeg specializing in new construction and renovations incorporating Passive House building methodologies with a focus on reducing TCBO through high-performance and resilient building methods. SCBC stated that high-performance and resilient building measures like air tightness and proper insulation are necessary for low-income housing because they dramatically reduce TCBO. SCBC indicated that in addition to the hypothesized contributions identified in the questionnaire they could contribute to the MSN through capital investments or committee membership. However, they also indicated that the time commitment required to participate fully could be a limiting factor. SCBC suggested that the MSN could result in a new independent co-operative. Given the innovative network concept, they suggested that the MSN could qualify for funding through CMHC for a pilot project.

## Discussion and Conclusions

Our study focused on the feasibility of creating an MSN in Winnipeg with five key stakeholders forming the initial membership. The questionnaire results confirmed our hypothesis regarding stakeholder’s potential contributions. There is a high interest among all the stakeholders in joining the MSN though most of them indicated that their capacity to participate may be hindered by a lack of time. Additionally, the low-income housing provider stakeholder identified that as a representative association they do not actually develop, own, or operate low-income housing units, but rather could help in convening connections between the MSN and their NPHP members who could provide those critical services instead. Further research is required to find an appropriate “Low-income Housing Provider” and “Material Supplier” located in Winnipeg to participate in the MSN.

Our study results corroborate the existing literature (Bachmann & Inkpen, 2011; Martins Rodrigues & Schneider, 2022; and Novkovic, 2014) showing the presence of social norms such as trust and reciprocity in co-operative networks, reducing the rigidity of contractual requirements. Three of the five research participants indicated that their organizations would not necessarily require formal agreements to join the MSN. Our data also suggests that the challenges of building low-income housing to a high-performance and resilient standard have been difficult to overcome by individual stakeholders, which echo the multi-stakeholder rationale proposed in the literature review. Themes consistent in the literature review include using systems-based approaches to complex issues, the importance of networks in managing complexity, and the establishment of absolute performance targets as opposed to relative targets (Bernhardt, 2020; Novkovic, 2014; Novkovic & Holm, 2011; Novkovic & McMahon, 2023; Novkovic & Miner, 2015; Raworth, 2017a).

Existing research on affordable housing needs in Winnipeg shows that additional housing units must be built to satisfy the growing demand. Historical data shows that homeownership costs are rising disproportionately to income so new construction projects must be built using methods that reduce TCBO. High-performance building standards



such as PHI are well suited to reduce build cost and TCBO because their systems-based approach incorporates absolute performance targets and passive design elements that reduce complexity. The development of affordable housing using a high-performance building standard aligns with the seventh principle of co-operatives. However, due to the growing inequality caused by the current economic system, co-ops must move beyond mere sustainability towards regenerative systems such as the DE framework, which also uses a systems-based approach with absolute performance targets. DE provides rationale for transitioning the current economic system from GDP growth to a more humanistic focus of providing a just and sustainable future for all of humanity.

Co-operative networks have the potential to create innovative organizational structures, and when aligned around a shared purpose, these networks leverage trust and reciprocity between stakeholders. The specific capabilities of each stakeholder contribute to reducing transactional and decision-making costs while the potential of achieving a larger scope of impact is enhanced. MSNs created around co-op values and principles can quickly build trust based on co-op institutional norms which allows for contractual ambiguity and reduces the need for complex control structures. Some grant and financing programs that support affordable housing development in Winnipeg are only available to non-profit organizations and others also require public-private partnerships providing further context for the use of an MSN approach for this project.

## References

- ACU. (2022a). *About*. <https://www.acu.ca/en/about>
- ACU. (2022b). *ACU - Investing in Community*. <https://www.acu.ca/en/about/our-community/investing-in-community>
- Altus Group. (2018). *2018 Canadian Cost Guide*. <https://creston.ca/DocumentCenter/View/1957/Altus-2018-Construction-Cost-Guide-web-1>
- Bachmann, R., & Inkpen, A. C. (2011). Understanding Institutional-based Trust Building Processes in Inter-organizational Relationships. *Organization Studies*, 32(2), 281–301. <https://doi.org/10.1177/0170840610397477>
- Bernhardt, R. (2020). *The Reference Building Approach*. Passive House Canada. <https://www.passivehousecanada.com/policy-series-5-the-reference-building-approach/>
- Borzaga, C., Depedri, S., & Tortia, E. (2011). Organizational Variety in Market Economies and the Role of Co-operative and Social Enterprises: A Plea for Economic Pluralism. *Journal of Co-Operative Studies*, 44(1), 19–30.
- Canada Mortgage and Housing Corporation. (n.d.). *National Housing Co-Investment Fund: Minimum Environmental & Accessibility Requirements—New Construction*. <https://assets.cmhc-schl.gc.ca/sites/cmhc/nhs/co-investment-fund/nhs-co-invest-fund-environmental-and-accessibility-new-construction-en.pdf?rev=963fdffa-3260-46e2-aa13-d73876ffbc8b>
- Canada Mortgage and Housing Corporation. (2023). *Housing Market Information: Rental Market Report*. <https://assets.cmhc-schl.gc.ca/sites/cmhc/professional/housing-markets-data-and-research/market-reports/rental-market-report/rental-market-report-2022-en.pdf>
- Canadian Real Estate Association. (n.d.). *Winnipeg Regional Real Estate Statistics*. <https://creastats.crea.ca/board/winn>
- Carter, Dr. T., Janzen, T., McCullough, S., Shirliffe, R., & Sinclair, E. (2020). *City of Winnipeg Comprehensive Housing Needs Assessment*. Institute of Urban Studies, University of Winnipeg. <https://legacy.winnipeg.ca/ppd/Documents/CityPlanning/Housing/ComprehensiveHousingNeedsAssessmentReport/Comprehensive-Housing-Needs-Assessment.pdf>
- City of Winnipeg. (n.d.). *Affordable Housing NOW*. Affordable Housing NOW. <https://www.winnipegaffordablehousingnow.ca/>
- CME SMU (Director). (2021, August 2). *Multi-stakeholder Lens (International Co-operative Governance Symposium)*. <https://www.youtube.com/watch?v=oveX9sVCBs0>
- Cole, W. (n.d.). *SEEFAR-Valuation@*. <https://seefar-valuation.com/seefar/>
- Cole, W. (2018). *Monetizing Building Sustainability: Homeowners Value Guide*. <https://seefar-valuation.com/wp-content/uploads/2018/09/Homeowner-guide-101-18.pdf?189db0&189db0>

Multi-Stakeholder Networks: Developing High-Performance  
Low-Income Housing within the Doughnut

- Cole, W. (2018, June). *Impact of High-Performance Homes* [Oral].
- Cook, M. (2018). A Life Cycle Explanation of Cooperative Longevity. *Sustainability*, 10(5), 1586. <https://doi.org/10.3390/su10051586>
- Efficiency Manitoba. (n.d.). *New Buildings Program 2.2*. <https://efficiencymb.ca/business/new-buildings/>
- Eikelenboom, M., & Long, T. B. (2022). Breaking the Cycle of Marginalization: How to Involve Local Communities in Multi-stakeholder Initiatives? *Journal of Business Ethics*. <https://doi.org/10.1007/s10551-022-05252-5>
- Espinosa, A., Harnden, R., & Walker, J. (2007). Beyond hierarchy: A complexity management perspective. *Kybernetes*, 36(3/4), 333–347. <https://doi.org/10.1108/03684920710746995>
- Freeman, R. (2017, March 27). *6 Estimates of Passive House Cost*. Rob Freeman. <https://robfreeman.com/6-estimates-passive-house-cost/>
- Freundlich, F. (2015). Governance in Mondragon. In S. Novkovic & K. Miner (Eds.), *Co-operative governance fit to build resilience in the face of complexity* (pp. 61–69). International Co-operative Alliance.
- Friedlingstein, P., O’Sullivan, M., Jones, M. W., Andrew, R. M., Gregor, L., Hauck, J., Le Quéré, C., Luijkx, I. T., Olsen, A., Peters, G. P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Alkama, R., ... Zheng, B. (2022). Global Carbon Budget 2022. *Earth System Science Data*, 14(11), 4811–4900. <https://doi.org/10.5194/essd-14-4811-2022>
- Girard, J.-P., & Langlois, G. (n.d.). Tracking the Social Impact of Solidarity Co-ops: Is the Multi-Stakeholder Approach a Way to Combat Exclusion? *Makingwaves*, 16(1), 5–8.
- Harrison, J., & St. John, C. (1996). Managing and Partnering with External Stakeholders. *The Academy of Management Executive*, 10(2), 46–60.
- Hough, J. (2018). *A Tribute to Harold Orr*. <https://www.mydigitalpublication.com/article/A+Tribute+To+Harold+Orr/3046046/485073/article.html>
- Housing Investment Corporation. (2023a). *Background*. <https://www.housinginvestment.ca/background>
- Housing Investment Corporation. (2023b). *What We Offer*. <https://www.housinginvestment.ca/offer>
- International Co-operative Alliance. (1995). *Cooperative identity, values & principles*. <https://www.ica.coop/en/cooperatives/cooperative-identity>
- International Co-operative Alliance. (2015). *Guidance Notes to the Co-operative Principals*. <https://www.ica.coop/sites/default/files/2021-11/ICA%20Guidance%20Notes%20EN.pdf>
- International Passive House Association. (n.d.). *Passive House*. [https://www.passivehouse-international.org/index.php?page\\_id=78](https://www.passivehouse-international.org/index.php?page_id=78)
- International Passive House Association. (2016, October 19). *The first Passive House: Interview with Dr. Wolfgang Feist*. IPHA Blog. <https://blog.passivehouse-international.org/first-passive-house-wolfgang-feist/>
- Kotyk, M. C. (2018). *Housing Models and Development Framework Executive Summary*. End Homelessness Winnipeg.
- Leviten-Reid, C., & Fairbairn, B. (2011). Multi-stakeholder Governance in Cooperative Organizations: Toward a New Framework for Research. *Canadian Journal of Nonprofit and Social Economy Research*, 2(2), 25–36.
- Lund, M. (2021). *A Learning Journey Through Cooperative Ecosystems*. The Industrial Commons.
- Magwood, C. (2018). *Whole Life Carbon Footprint & True Zero Carbon Buildings: Avoiding the Narrow Pathway to Unintended Climate Change Consequences*. Passive House Canada Conference, Vancouver, Canada. [https://www.suncertifiedbuilders.com/resources/pages/files/Footprint\\_Magwood.pdf](https://www.suncertifiedbuilders.com/resources/pages/files/Footprint_Magwood.pdf)
- Manitoba Hydro. (n.d.). *Historical electricity and Natural gas rates*. Historical Electricity and Natural Gas Rates. [https://www.hydro.mb.ca/accounts\\_and\\_services/rates/historical\\_rates/](https://www.hydro.mb.ca/accounts_and_services/rates/historical_rates/)
- Manitoba Non-Profit Housing Association. (2023). *About MNPHA*. <https://mnpha.com/about/>
- Martins Rodrigues, J., & Schneider, N. (2022). Scaling Co-operatives Through a Multi-Stakeholder Network: A Case Study in the Colorado Solar Energy Industry. *The Journal of Entrepreneurial and Organizational Diversity*, 10(2), 29–53. <https://doi.org/10.5947/jeod.2021.008>
- Mezani, T., & Zamangi, V. (2010). Co-operative Networks in the Italian Economy. *Enterprise and Society*, 11(1), 98–127.
- Miner, K., & Novkovic, S. (2020, October 30). *Diversity in Governance*. NCBA CLUSA.
- Novkovic, S. (2014). Co-operative Networks, Adaptability and Organizational Innovations. In C. Gijssels, L. Zhao, & S. Novkovic (Eds.), *Co-operative Innovations in China and the West* (pp. 47–63). Palgrave Macmillan UK. [https://doi.org/10.1057/9781137277282\\_4](https://doi.org/10.1057/9781137277282_4)

- Novkovic, S. (2020, October 15). *Co-operatives and New Economic Paradigms*. [https://www.youtube.com/watch?v=YEAcLOa8ni0&ab\\_channel=CMESMU](https://www.youtube.com/watch?v=YEAcLOa8ni0&ab_channel=CMESMU)
- Novkovic, S., & Holm, W. (2011, August 25). *Co-operative Networks as a Source of Organizational Innovation*. ICA Global Research Conference, Mikkeli, Finland.
- Novkovic, S., & McMahon, C. (2023). Humanism and the Cooperative Enterprise: Theoretical Foundations. In S. Novkovic, K. Miner, & C. McMahon (Eds.), *Humanistic Governance in Democratic Organizations: The Cooperative Difference* (pp. 17–40). Springer International Publishing. <https://doi.org/10.1007/978-3-031-17403-2>
- Novkovic, S., & Miner, K. (2015). Introduction: Co-operative Governance Fit to Build Resilience in the Face of Complexity. In *Co-operative Governance Fit to Build Resilience in the Face of Complexity* (pp. 10–21). International Co-operative Alliance.
- Novković, S., Miner, K., & McMahon, C. (Eds.). (2023). *Humanistic Governance in Democratic Organizations: The Cooperative Difference*. Springer International Publishing. <https://doi.org/10.1007/978-3-031-17403-2>
- Öberg, C. (2019). The role of business networks for innovation. *Journal of Innovation & Knowledge*, 4(2), 124–128. <https://doi.org/10.1016/j.jik.2017.10.001>
- Passive House Canada. (2022, November). *Comparison of High-Performance Building Standards*. <https://www.passivehousecanada.com/comparison-of-high-performance-building-standards/>
- Passive House Institute. (2023). *Criteria for Buildings*. [https://passiv.de/downloads/O3\\_building\\_criteria\\_en.pdf](https://passiv.de/downloads/O3_building_criteria_en.pdf)
- Perkins, P. E. (2015). Building Commons Governance for a Greener Economy. In R. C. Mitchell & S. A. Moore (Eds.), *Planetary Praxis & Pedagogy* (pp. 133–145). SensePublishers. [https://doi.org/10.1007/978-94-6300-214-1\\_8](https://doi.org/10.1007/978-94-6300-214-1_8)
- Pirson, M., & Turnbull, S. (2011). Toward a More Humanistic Governance Model: Network Governance Structures. *Journal of Business Ethics*, 99(1), 101–114. <https://doi.org/10.1007/s10551-011-0752-x>
- Proven, E. (2014). *What is a Larson Truss*. Projects. <https://www.suncertifiedbuilders.com/en/Larson%20Truss>
- Proven, E. (2023, May 8). *Pandemic's Effect on High Performance Building Materials*. Sun Certified Builders. <https://www.suncertifiedbuilders.com/en/rants>
- Province of Manitoba. (n.d.). *Families—Manitoba Housing*. <https://www.gov.mb.ca/housing/progs/mha.html>
- Raddatz, B. (2022). *Community Energy Investment Roadmap to Reach Net Zero Emissions by 2050* (O-001; p. 11). City of Winnipeg Water and Waste Department.
- Raworth, K. (2017a). *Doughnut Economics: Seven Ways to Think Like a 21st Century Economist*. Chelsea Green Publishing. <https://www.kateraworth.com/doughnut/>
- Raworth, K. (2017b). Why it's time for Doughnut Economics. *IPPR Progressive Review*, 24(3), 216–222. <https://doi.org/10.1111/newe.12058>
- Roloff, J. (2008). Learning from Multi-Stakeholder Networks: Issue-Focused Stakeholder Management. *Journal of Business Ethics*, 82(1), 233–250. <https://doi.org/10.1007/s10551-007-9573-3>
- Ross, F. (2019). Kate Raworth - Doughnut Economics: Seven Ways to Think Like a 21st Century Economist (2017). *Regional and Business Studies*, 11(2). <https://doi.org/10.33568/rbs.2409>
- Ryan, J. (2014, November 7). New Study Verifies Steel Roofs Can Last as Long as The Buildings They Cover: Typically 60 Years or More. *Metal Construction Association Blog*. <https://blog.metalconstruction.org/2014/11/07/new-study-verifies-coated-steel-roofs-can-last-as-long-as-the-buildings-they-cover-typically-60-years-or-more/>
- Sacchetti, S., & Tortia, E. (2014). Multi-stakeholder Governance. A social enterprise case study. *The International Journal of Co-Operative Management*, 7(1), 58–72.
- Serroukh, J., & Hashemi, A. (2021). Comparative Performance Analysis of Passivhaus and Building Regulation Certified Properties Built in The United Kingdom. *ZEMCH 2021*. 8th Zero Energy Mass Custom Home International Conference, Dubai, United Arab Emirates.
- Statistics Canada. (2022a, September 21). *The Daily — To buy or to rent: The housing market continues to be reshaped by several factors as Canadians search for an affordable place to call home*. Government of Canada. <https://www150.statcan.gc.ca/n1/daily-quotidien/220921/dq220921b-eng.htm>
- Statistics Canada. (2022b, September 21). *Unaffordable housing rates are down across Canada in 2021, except in Alberta*. Government of Canada. <https://www150.statcan.gc.ca/n1/daily-quotidien/220921/mc-b004-eng.htm>

Multi-Stakeholder Networks: Developing High-Performance  
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- Statistics Canada. (2022c). *Maintenance and repair expenditures in housing* [Data set]. Government of Canada. <https://doi.org/10.25318/3410009501-ENG>
- Statistics Canada. (2023, February 24). *A snapshot of how inflation is affecting Canadians*. Government of Canada. <https://www.statcan.gc.ca/o1/en/plus/3096-snapshot-how-inflation-affecting-canadians>
- True North Mortgage. (n.d.). *Mortgage Brokers in Manitoba*. <https://www.truenorthmortgage.ca/rates/manitoba>
- Turner, R. A., & Wills, J. (2022). Downscaling doughnut economics for sustainability governance. *Current Opinion in Environmental Sustainability*, 56, 101180. <https://doi.org/10.1016/j.cosust.2022.101180>
- Vancity. (n.d.). *Affordable Housing Accelerator Program & Fund*. <https://rethink.vancity.com/actions/affordable-housing-accelerator-fund>
- Wageningen Centre for Developmental Innovation (Director). (2019, November 5). *Multi Stakeholder Partnership Rationale*. <https://www.youtube.com/watch?v=kB-LSJCjWQQ>
- Wikipedia. (2023a). *Impact investing*. [https://en.wikipedia.org/w/index.php?title=Impact\\_investing&oldid=1141941839](https://en.wikipedia.org/w/index.php?title=Impact_investing&oldid=1141941839)
- Wikipedia. (2023b). *Integrated Project Delivery*. [https://en.wikipedia.org/w/index.php?title=Integrated\\_project\\_delivery&oldid=1143648861](https://en.wikipedia.org/w/index.php?title=Integrated_project_delivery&oldid=1143648861)
- Wilson, A., Hoyt, A., Roelants, B., & Kumar, S. (2021, December). *Examining our Cooperative Identity*. World Cooperative Congress, Seoul, Republic of Korea.

Appendix

## Research Questionnaire - Feasibility Study: Developing High-Performance Low-Income Housing using a Multi-stakeholder Network Approach

### Respondent - Manitoba Non-Profit Housing Association

The purpose of this survey is to help determine the feasibility of establishing a Multi-stakeholder Network (MSN) in Winnipeg that would develop multi-unit residential low-income housing units to a high-performance and resilient building standard. As outlined in the Informed Consent Form, an MSN is a business networking strategy employed by Co-ops and Social Enterprises to achieve economies of scale in the pursuit of social and economic goals. MSN's typically form to address a common goal rather than one specific to an individual stakeholder. Through this survey we hope to gain information on our stakeholder groups to corroborate our hypothesis about their contributions.

This survey focuses on one organization from each of the following stakeholder groups: low-income housing providers, lenders/impact investors, general contractors, material suppliers, high performance building specialists. We assume that the Manitoba Non-Profit Housing Association (MNPFA) could represent the low-income housing provider stakeholder group. Among possible contributions, we estimate that low income housing providers could contribute to the MSN by acting as the developer for low-income multi-unit residential building projects. We also understand that this stakeholder group could become the owner or property manager of projects developed by the MSN. We hypothesize that the MNPFA could contribute to the MSN by using its knowledge of the low-income housing sector to build key relationships between its membership and the MSN. These rolls are initial hypothesis subject to change during the research development, open to other suggestions and proposals coming from MNPFA.

Does the opening paragraph of this survey accurately describe MNPFA's potential contributions to the MSN?

Yes

No



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Are you aware of any contributions not listed that MNPFA could provide to help the MSN achieve its goals?  
If none please indicate.

MNPFA could also contribute to advocacy/government relations with funders that have grant and financing programs  
targetted to energy retrofits and new low-income housing development

Based on the brief description of the MSN in the Informed Consent form, your organization would be  
\_\_\_\_\_ join(ing) such a network?

- very interested in
- interested in
- unlikely to
- not interested in

If interest is indicated, in what capacity would your organization join the MSN? What kind of skin would you  
put in the game? (advisor, steering committee member, investor, stakeholder member etc.) Briefly describe  
what you envision MNPFA's participation in the MSN would look like.

Advisor; MNPFA has limited capacity to engage in networks that take a great deal of time and generally prioritizes  
those that our members themselves prioritize. We can provide advice and connections, disseminate information to  
housing providers, organize events/workshops, etc.

Does high-performance low-income housing development fit with MNPFA's mission and vision?

- Yes
- no

If yes, please explain how.

MNPHA's mission is to support our members to create a thriving, sustainable non-profit housing sector. Sustainability includes economic, social, and environmental sustainability.

What benefit do you see for MNPHA in becoming a member of this MSN?

The ability for our members to be connected to those with expertise and capacity in development and renewal to be able to create/rennovate their buildings; the ability to reduce costs and constraints in high-performance low-income housing and support partners to solve challenges that have prevented housing providers from developing or reinnovating to high standards (maintenance, technical challenges, limited capacity to oversee projects, etc.)

Please describe any hesitations your organization might have about joining the MSN?

Competing priorities can be a challenge - our members prioritize affordability (often due to funders' requirements, which focus on short-term affordability rather than life-cycle costs) and have extremely limited resources to undertake development or renewal. Additionally, with low-income housing development at such a small scale (300 units a year maximum), it is difficult to build up the expertise and business services and attracting members to the network may be a challenge due to the limited market. Finally, without in-house capacity ourselves to assess business partners and consultants, MNPHA avoids making recommendations to our members and rather gives them contact information for organizations that have direct experience with various businesses and consultants to collect their own recommendations and make decisions based on their needs and capacity.

Please describe any novel solutions you are aware of that would support the goals of the MSN (lowering the cost of constructing multi-unit residential buildings, reducing the cost of the resulting debt payments required to address the additional cost of high performance and resilient building methods, reducing the total cost of building ownership)? If none please indicate.

Would a partnership with other nonprofits or co-ops be acceptable to your stakeholders/board?

Yes

No

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What level of agreement would be required by your organization to create a partnership with other MSN stakeholders?

- Informal
- Contract
- Memorandum of Understanding
- Incorporation of a new Co-operative

Please describe any funding opportunities you are aware of that could be available to support the MSN or its goal? If none please indicate.

Community Housing Transformation Centre; Federation of Canadian Municipalities; Efficiency Manitoba; CMHC

Other than the competencies/contributions identified in this survey, please describe any competencies/contributions that you think would be necessary for the success of the MSN?

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## Research Questionnaire - Feasibility Study: Developing High-Performance Low-Income Housing using a Multi-stakeholder Network Approach

### Respondent - Assiniboine Credit Union

The purpose of this survey is to help determine the feasibility of establishing a Multi-stakeholder Network (MSN) in Winnipeg that would develop multi-unit residential low-income housing units to a high-performance and resilient building standard. As outlined in the Informed Consent Form, an MSN is a business networking strategy employed by Co-ops and Social Enterprises to achieve economies of scale in the pursuit of social and economic goals. MSN's typically form to address a common goal rather than one specific to an individual stakeholder. Through this survey we hope to gain information on our stakeholder groups to corroborate our hypothesis about their contributions.

This survey focuses on one organization from each of the following stakeholder groups: developers, lenders/impact investors, general contractors, material suppliers, high performance building specialists. We assume that Assiniboine Credit Union (ACU) falls into the lenders/impact investors stakeholder group. Among possible contributions, we estimate that ACU could contribute to the MSN by acting as a lender to finance the development in low-income multi-unit residential building projects. We also understand that ACU could provide impact investments to help fund the MSN. These rolls are initial hypothesis subject to change during the research development, open to other suggestions and proposals coming from ACU.

Does the opening paragraph of this survey accurately describe ACU's potential contributions to the MSN?

Yes

No

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Are you aware of any contributions not listed that ACU could provide to help the MSN achieve its goals? If none please indicate.

Promotion, Advocacy, Training and Education

Based on the brief description of the MSN in the Informed Consent form, your organization would be \_\_\_\_\_ join(ing) such a network?

- very interested in
- interested in
- unlikely to
- not interested in

If interest is indicated, in what capacity would your organization join the MSN? What kind of skin would you put in the game? (advisor, steering committee member, investor, stakeholder member etc.) Briefly describe what you envision ACU's participation in the MSN would look like.

As deemed necessary and relevant based on financial cooperative mandate

Does supporting high-performance low-income housing development fit with ACU's mission and vision?

- Yes
- no

If yes, please explain how.

We use finance for good to help members (including not for profit housing) fulfill their mandate in providing access to safe, affordable housing.



What benefit do you see for ACU in becoming a member of this MSN?

Aligns with ACU's mission to reinvest in our community to benefit people and planet.

Please describe any hesitations your organization might have about joining the MSN.

Time commitment to fully engage

Please describe any novel solutions you are aware of that would support the goals of the MSN (lowering the cost of constructing multi-unit residential buildings, reducing the cost of the resulting debt payments required to address the additional cost of high performance and resilient building methods, reducing the total cost of building ownership)? If none please indicate.

1. Provide access to a capital fund in cases where equity gaps exists for financing. 2. Also to train and educate management and governance level leaders within the sector. 3. Lobby government and key stakeholders (eg appraisers, developers) to partner in stimulating new affordable housing stock.

Would a partnership with other co-ops or nonprofits be acceptable to your stakeholders/board?

Yes

No

What level of agreement would be required by your organization to create a partnership with other MSN stakeholders?

Informal

Contract

Memorandum of Understanding

Incorporation of a new Co-operative

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Please describe any other funding opportunities you are aware of that could be available to support the MSN or its goal? If none please indicate.

NIL

Other than the competencies/contributions identified in this survey, please describe any competencies/contributions that you think would be necessary for the success of the MSN?

Cross sectoral collaboration between public, private and not for profit sectors

## Research Questionnaire - Feasibility Study: Developing High-Performance Low-Income Housing using a Multi-stakeholder Network Approach

### Respondent - Purpose Construction

The purpose of this survey is to help determine the feasibility of establishing a Multi-stakeholder Network (MSN) in Winnipeg that would develop multi-unit residential low-income housing units to a high-performance and resilient building standard. As outlined in the Informed Consent Form, an MSN is a business networking strategy employed by Co-ops and Social Enterprises to achieve economies of scale in the pursuit of social and economic goals. MSN's typically form to address a common goal rather than one specific to an individual stakeholder. Through this survey we hope to gain information on our stakeholder groups to corroborate our hypothesis about their contributions.

This survey focuses on one organization from each of the following stakeholder groups: developers, lenders/impact investors, general contractors, material suppliers, high performance building specialists. We assume that Purpose Construction (PC) falls into the general contractors stakeholder group. Among possible contributions, we estimate that PC could contribute to the MSN by providing labour and managing sub trades for the development in low-income multi-unit residential building projects. We also understand that as a nonprofit Social Enterprise PC can access grants and charitable donations to help fund the development of low-income housing units. These rolls are initial hypothesis subject to change during the research development, open to other suggestions and proposals coming from PC.

Does the opening paragraph of this survey accurately describe PC's potential contributions to the MSN?

Yes

No

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Are you aware of any contributions not listed that PC could provide to help the MSN achieve its goals? If none please indicate.

We are currently developing a relationship with the Jubilee Fund to structure investment into affordable homeownership models - specifically rent-to-own. We would be happy to bring that relationship to the table.

We also have a relationship with CorCan, a trades training program within Stoney Mountain Penitentiary to pre-fabricate wall sections of our housing builds. They have indicated an interest in developing pre-insulated high performing wall sections in their shop, but currently lack the training capacity/knowledge to lead that process.

Based on the brief description of the MSN in the Informed Consent form, your organization would be \_\_\_\_\_ join(ing) such a network?

- very interested in
- interested in
- unlikely to
- not interested in

If interest is indicated, in what capacity would your organization join the MSN? What kind of skin would you put in the game? (advisor, steering committee member, investor, stakeholder member etc.) Briefly describe what you envision PC's participation in the MSN would look like.

We would be happy to join in whatever capacity is most useful. We are committed to developing affordable housing using social finance models, and are deeply interested in exploring opportunities to make that housing as high performing from an energy use perspective as possible while protecting affordability.

Does supporting high-performance low-income housing development fit with PC's mission and vision?

- Yes
- no

If yes, please explain how.

We have a strategic goal of continuing to expand our affordable housing work, and to exploring opportunities for 'net zero' (or similar high performance builds) as we continue to expand our work.

What benefit do you see for PC in becoming a member of this MSN?

We would love to do this work in partnership with other interested groups, specifically groups that add expertise around energy performance.

Please describe any hesitations your organization might have about joining the MSN.

In the past, we haven't been able to make the numbers work on housing that is both high energy performance and affordable. We've been able to build to Efficiency Manitoba New Home Standard (20% better than code I believe), but making the numbers work has been really challenging.

Please describe any novel solutions you are aware of that would support the goals of the MSN (lowering the cost of constructing multi-unit residential buildings, reducing the cost of the resulting debt payments required to address the additional cost of high performance and resilient building methods, reducing the total cost of building ownership)? If none please indicate.

I think partnering with social enterprise to leverage training funding opportunities and deepen the social impact of the build is a really novel move and quite attractive to funders.

Would a partnership with other nonprofits or co-ops be acceptable to your stakeholders/board? \*

Yes

No



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What level of agreement would be required by your organization to create a partnership with other MSN stakeholders?

- Informal
- Contract
- Memorandum of Understanding
- Incorporation of a new Co-operative

Please describe any other funding opportunities you are aware of that could be available to support the MSN or its goal? If none please indicate.

<https://impact.canada.ca/en/challenges/building-for-the-future>

Other than the competencies/contributions identified in this survey, please describe any competencies/contributions that you think would be necessary for the success of the MSN?

## **Research Questionnaire - Feasibility Study: Developing High-Performance Low-Income Housing using a Multi-stakeholder Network Approach**

### **Respondent - Homestead Consumers Co-operative**

The purpose of this survey is to help determine the feasibility of establishing a Multi-stakeholder Network (MSN) in Winnipeg that would develop multi-unit residential low-income housing units to a high-performance and resilient building standard. As outlined in the Informed Consent Form, an MSN is a business networking strategy employed by Co-ops and Social Enterprises to achieve economies of scale in the pursuit of social and economic goals. MSN's typically form to address a common goal rather than one specific to an individual stakeholder. Through this survey we hope to gain information on our stakeholder groups to corroborate our hypothesis about their contributions.

This survey focuses on one organization from each of the following stakeholder groups: developers, lenders/impact investors, general contractors, material suppliers, high performance building specialists. We assume that Homestead Consumers Co-operative (HCC) falls into the material suppliers stakeholder group. Among possible contributions, we estimate that HCC could contribute to the MSN by providing discounts on building materials supplied for the development in low-income multi-unit residential building projects. These rolls are initial hypothesis subject to change during the research development, open to other suggestions and proposals coming from HCC.

Does the opening paragraph of this survey accurately describe HCC's potential contributions to the MSN?

Yes

No

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Are you aware of any contributions not listed that HCC could provide to help the MSN achieve its goals? If none please indicate.

\*If formal Status of MSN or a stakeholder in the MSN is in a non-profit potential donations could be available. Sponsorship of programs could also be an option.

Based on the brief description of the MSN in the Informed Consent form, your organization would be \_\_\_\_\_ join(ing) such a network?

- very interested in
- interested in
- unlikely to
- not interested in

If interest is indicated, in what capacity would your organization join the MSN? What kind of skin would you put in the game? (advisor, steering committee member, investor, stakeholder member etc.) Briefly describe what you envision HCC's participation in the MSN would look like.

HCC has the capacity to be a stakeholder member and potentially an advisory role and or steering committee member. HCC has expertise in the home and building industry, along with vested interests in social and environmental responsibility.

Does supporting high-performance low-income housing development fit with HCC's mission and vision?

- Yes
- no

If yes, please explain how.

HCC purpose/ Vision is "Enhancing Community Life". HCC achieves this purpose statement by working Together, building relationships, leading in service and positively impacting communities with every interaction. High-performance housing has positive environmental benefit and finding solutions for the lack of availability of low income housing would support HCC Vision and Mission through Corporate Responsibility

What benefit do you see for HCC in becoming a member of this MSN?

Finding solutions for social and environmental issues. HCC would enhance its corporate citizenship. HCC would see benefits in networking and working with others in the same industry, enhancing expertise at our locations. HCC could be a potential supplier of building materials. HCC would be interested in programing communities that they serve, ex Portage La Prairie. HCC could be a supplier of materials for projects

Please describe any hesitations your organization might have about joining the MSN.

Time commitments,

Please describe any novel solutions you are aware of that would support the goals of the MSN (lowering the cost of constructing multi-unit residential buildings, reducing the cost of the resulting debt payments required to address the additional cost of high performance and resilient building methods, reducing the total cost of building ownership)? If none please indicate.

could a model such as the Habitat for Humanity program be utilized?

Would a partnership with other co-ops or nonprofits be acceptable to your stakeholders/board?

Yes

No

Multi-Stakeholder Networks: Developing High-Performance  
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What level of agreement would be required by your organization to create a partnership with other MSN stakeholders?

- Informal
- Contract
- Memorandum of Understanding
- Incorporation of a new Co-operative

Please describe any other funding opportunities you are aware of that could be available to support the MSN or its goal? If none please indicate.

as mentioned above, Sponsorships and/or donations could be available based on the locations of the projects (in the communities that HCC servers, Portage La Prairie etc.)

Other than the competencies/contributions identified in this survey, please describe any competencies/contributions that you think would be necessary for the success of the MSN?



## Research Questionnaire - Feasibility Study: Developing High-Performance Low-Income Housing using a Multi-stakeholder Network Approach

### Respondent - Sun Certified Builders Co-operative

The purpose of this survey is to help determine the feasibility of establishing a Multi-stakeholder Network (MSN) in Winnipeg that would develop multi-unit residential low-income housing units to a high-performance and resilient building standard. As outlined in the Informed Consent Form, an MSN is a business networking strategy employed by Co-ops and Social Enterprises to achieve economies of scale in the pursuit of social and economic goals. MSN's typically form to address a common goal rather than one specific to an individual stakeholder. Through this survey we hope to gain information on our stakeholder groups to corroborate our hypothesis about their contributions.

This survey focuses on one organization from each of the following stakeholder groups: developers, lenders/impact investors, general contractors, material suppliers, high performance building specialists. We assume that Sun Certified Builders Co-op (SCBC) falls into the high performance building specialist stakeholder group. Among possible contributions, we estimate that SCBC could contribute to the MSN by providing design, energy modelling, and construction labour services for the development in low-income multi-unit residential building projects. We also understand that as a co-operative SCBC can provide its services at a reduced profit margin to help fund the development of low-income housing units. These rolls are initial hypothesis subject to change during the research development, open to other suggestions and proposals coming from SCBC.

Does the opening paragraph of this survey accurately describe SCBC's potential contributions to the MSN?

Yes

No

Multi-Stakeholder Networks: Developing High-Performance  
Low-Income Housing within the Doughnut

Are you aware of any contributions not listed that SCBC could provide to help the MSN achieve its goals? If none please indicate.

Potential Passive House Certification services

Based on the brief description of the MSN in the Informed Consent form, your organization would be \_\_\_\_\_ join(ing) such a network?

- very interested in
- interested in
- unlikely to
- not interested in

If interest is indicated, in what capacity would your organization join the MSN? What kind of skin would you put in the game? (advisor, steering committee member, investor, stakeholder member etc.) Briefly describe what you envision SCBC's participation in the MSN would look like.

SCBC would like to be as involved as possible - investor, stakeholder member, committee member, service provider, etc.

Does supporting high-performance low-income housing development fit with SCBC's mission and vision?

- Yes
- no

If yes, please explain how.

SCBC formed as a way to build high performance buildings, which we saw as necessary for human survival. This provides meaning and gainful employment to our members. We want these buildings to be the default for groups providing low income housing as the operating costs are much lower.

What benefit do you see for SCBC in becoming a member of this MSN?

We have experience in the design and construction of High Performance Buildings (HPB) as well as the desire to contribute to our community. Our cooperative structure lends itself to community benefit.

Please describe any hesitations your organization might have about joining the MSN.

Time commitments and labour turnover.

Please describe any novel solutions you are aware of that would support the goals of the MSN (lowering the cost of constructing multi-unit residential buildings, reducing the cost of the resulting debt payments required to address the additional cost of high performance and resilient building methods, reducing the total cost of building ownership)? If none please indicate.

Our building method involves insulation and airtightness. Investing in these systems generally results in lower TCBO. Our method is proven and can be certified.

Would a partnership with other co-ops or nonprofits be acceptable to your stakeholders/board?

- Yes
- No

What level of agreement would be required by your organization to create a partnership with other MSN stakeholders?

- Informal
- Contract
- Memorandum of Understanding
- Incorporation of a new Co-operative

Multi-Stakeholder Networks: Developing High-Performance  
Low-Income Housing within the Doughnut

Please describe any other funding opportunities you are aware of that could be available to support the MSN or its goal? If none please indicate.

Federal Greener Homes Initiative, Efficiency MB programs, CMHC might have funding for "pilot" projects.

Other than the competencies/contributions identified in this survey, please describe any competencies/contributions that you think would be necessary for the success of the MSN?

Strong project management.