



# Greening Small and Medium-Sized Enterprises: Women Entrepreneurs and the Path to Net Zero



## Partners



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The [Future Skills Centre \(FSC\)](#) is a forward-thinking centre for research and collaboration dedicated to driving innovation in skills development so that everyone in Canada can be prepared for the future of work. We partner with policymakers, researchers, practitioners, employers and labour, and post-secondary institutions to solve pressing labour market challenges and ensure that everyone can benefit from relevant lifelong learning opportunities. We are founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada, and are funded by the [Government of Canada's Future Skills Program](#).



Coralus collectively practices different ways of doing things for a better now and a new inheritance. Members offer and access resources at their own pace, creating a self-regenerating pay-it-forward pool of skills, connections, funds, and support then used to advance ventures and the collective doing world changing work. As of February 2024, Coralus has circulated over \$18M to 180+ women- and nonbinary-led ventures by distributing capital via collective decision-making. 45% of those founders are from chronically excluded racial and ethnic groups. The payback rate on its unsecured 0% interest loans is 95%. Founded in Canada in 2015, Coralus' current footprint includes the US, Australia, New Zealand, and the UK.

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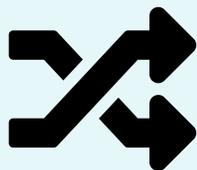


# Executive Summary

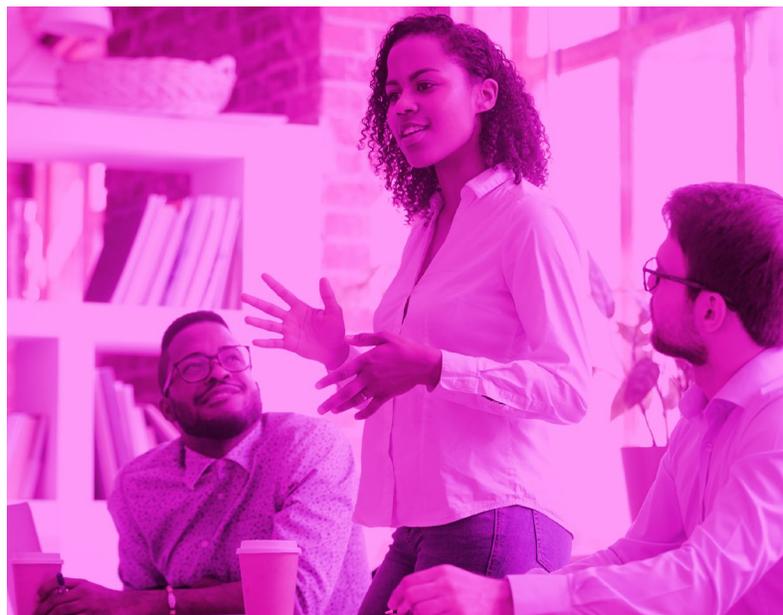
The transition toward a net-zero economy is gaining momentum in Canada, and women-owned small and medium-sized enterprises (SMEs) are an important part of this evolution. Not only are SMEs owned by women more likely to prioritize sustainability, but women entrepreneurs are reshaping technologies, processes, products and services, and creating a way forward.

Canada's net-zero goals are articulated in the *2030 Emissions Reduction Plan*. The transition to net zero requires action in businesses across sectors and at every stage of the value chain.

Research has shown that women entrepreneurs are more likely to prioritize sustainability goals, and while under-represented in green tech, they are leading innovations across sectors and the value chain. Our case studies of 43 women entrepreneurs show the diversity of their contributions to the net-zero economy. These “greenpreneurs” are driving sustainable and net-zero initiatives through the entire value system from procurement, to operations, to sales and marketing and distribution. At the same time, women greenpreneurs face barriers at multiple levels and identify supports that they need to realize their potential.



*Not only are SMEs owned by women more likely to **prioritize sustainability**, but women entrepreneurs are **reshaping technologies, processes, products and services**, and creating a way forward.*



The women entrepreneurs we surveyed explained how they draw on their skills, education and experience, and personal attributes. They had strong, defined values,

which translate to sustainability initiatives in their organizations despite misalignment with the entrepreneurship ecosystem.

This exploratory study has reinforced several themes.

**1**

A net-zero economy will not be created through capital-intensive, technological development alone. The pathways to net zero, like the transformation associated with digitization, require the adoption of new policies, processes and behaviours throughout the ecosystem.

**2**

SMEs play an important role in the Canadian economy. While green tech is important, there needs to be more focus on the adoption of new technologies and processes, and the development of new products and services to drive “greenification” of SMEs in the country’s transition to net zero.

**3**

Women and other diverse entrepreneurs can make valuable contributions in the push toward net zero across sectors and at various stages in the value chain and should be actively engaged in the strategy.

**4**

A wide range of skills is required for sustainable entrepreneurship; training and support programs must expand their focus beyond developing technology skills.

**5**

SMEs need more information, knowledge, mentorship and support to “greenify” their operations and develop plans to support their transition to net zero.



# Background

## Introduction

The Government of Canada committed to a net-zero economy by the year 2050 with the *Canadian Net-Zero Emissions Accountability Act*.<sup>1</sup> To meet this goal, the federal government has crafted a broad policy agenda for transforming the Canadian economy and society and earmarked more than \$120 billion in investments since 2016.<sup>2</sup> A net-zero economy promises great opportunities for the Canadian economy, businesses and workers.

Small and medium-sized enterprises (SMEs) play an important role in the Canadian economy. They represent 99.8% of employer businesses and hire 88.2% of employees in the private sector.<sup>3</sup> They also account for a large percentage of carbon emissions—even more than the Canadian oil and gas sector. By reducing their greenhouse gas (GHG) emissions, SMEs can contribute significantly to Canada’s efforts to achieve net-zero emissions by 2050.

Women entrepreneurs have a special role to play in the net-zero economy, particularly in catalyzing the transition toward sustainable SMEs. Not only do women entrepreneurs comprise a sizable percentage of total entrepreneurship activity in Canada, but

research also suggests that they focus more on sustainability initiatives compared with men entrepreneurs.<sup>4,5</sup>

The research clearly shows that women entrepreneurs have the potential to make significant contributions toward achieving net-zero goals in Canada through their businesses. This report identifies the contributions of women entrepreneurs to Canada’s net-zero goals. It is also interested in the strategies and approaches employed by women entrepreneurs to promote sustainable business practices that enable SMEs to become effective agents of change.

For this investigation, we interviewed 43 women entrepreneurs whose businesses are contributing directly to a net-zero economy. The Diversity Institute’s sustainability framework is used to evaluate the contributions of women-led SMEs. The sustainability framework is based on previous research and applications of the Diversity Institute’s ecological model. By evaluating the data and research through the framework, the ways in which “greenpreneurs” have contributed to net-zero targets are identified. The analysis also provides insight into the innovations women entrepreneurs have made in the value chain and their practices.



## Canada's commitments for the transition to net zero

Recognizing the urgency of the global climate crisis, the Government of Canada is taking significant steps to shift the country toward a net-zero economy. There have been many key policies since Canada's first national climate plan in 2016, the *Pan-Canadian Framework on Clean Growth and Climate Change*.<sup>6</sup> Subsequent plans include the *A Healthy Environment and a Healthy Economy* plan in 2020<sup>7</sup> and the *2030 Emissions Reduction Plan* in 2022<sup>8</sup>. These efforts aim to transition Canada into a net-zero emissions economy by 2050, a goal enshrined in legislation in the *Net-Zero Emissions Accountability Act*, which sets legally binding GHG reduction targets and requires regular reporting and monitoring of progress toward achieving these targets.<sup>9</sup> By implementing the Act, Canada is

committing to climate action, holding itself accountable for achieving emissions targets and ensuring transparency in its progress toward meeting them.

## The role of small and medium-sized enterprises

Small and medium-sized enterprises play a critical role in Canada's economy.

As noted, they represent:

**99.8%** of employer businesses in Canada

**88.2%** of private employment<sup>10</sup>

A significant portion of SMEs are micro-businesses:

**55.3%** of companies have fewer than five employees

**74.1%** have fewer than 10 employees<sup>11</sup>

Recent research from the Business Development Bank of Canada (BDC) estimates that businesses are responsible for:

**80%** of the annual GHG emissions in Canada

SMEs account for:

**52%** of all GHGs by Canadian businesses

**41%** of all GHGs in Canada<sup>12</sup>

Climate change is the most pressing environmental challenge, and SMEs are particularly vulnerable as extreme weather changes can have a severe impact on their business operations with significant financial consequences.<sup>13</sup> It is evident that successful engagement with SMEs is required to achieve a net-zero economy.

However, SMEs face difficulties with the “greenification” of their activities. Globally, the UN-backed Climate Hub’s survey of member SMEs suggests that small businesses lack the skills and knowledge (63%), funding (48%) and time (40%) for climate action.<sup>14</sup> Data on Canadian SMEs are similar. BDC’s recent survey of SMEs found that about 50% of Canadian SMEs have acted to reduce their carbon footprint in the next five years, while 18% have not acted yet but intend to do so; 32% have not acted, nor do they plan on doing so. Of those SMEs that have not acted and do not plan on acting, 57% believe that climate change will not affect their businesses.<sup>15</sup> A 2022 survey by the BMO Climate Institute shows that, among SMEs not acting, 15% do not know where to begin and 28% cite cost as a deterrent.<sup>16</sup>

There are some supports emerging, like BDC’s \$150-million Sustainability Venture Fund, which invests in early-stage businesses developing technologies to meet the United Nations’ Sustainable Development Goals (SDGs).<sup>17</sup> Natural Resources Canada’s Building Capacity with the Smart Renewables and Electrification Pathways Program provides up to \$2 million over four years to support renewable energy projects and to transform the electrical

grid.<sup>18</sup> While there is some financial support aimed at SMEs to help with the sustainability transition, among 99 federal policies and programs aimed at climate action, only five are directed at SMEs.<sup>19</sup>

## The role of women entrepreneurs

In Canada, about one-fifth of SMEs are women-owned<sup>20</sup> and nearly 40% of self-employed Canadians are women.<sup>21</sup> Given this, we can make a case for engaging women entrepreneurs to help Canada reach its 2050 net-zero target; however, other important reasons for engaging women entrepreneurs exist. Globally and locally, women are disproportionately affected by climate change. For example, during a natural disaster, women are 14 times more likely to die or be injured than men.<sup>22</sup> Women entrepreneurs thus bring valuable lived experiences to drive climate change action through entrepreneurship.<sup>23</sup>

Women entrepreneurs are more interested in setting up their businesses in green industries than conventional ones.<sup>24</sup> Research also shows that women-led companies are more likely to pursue social and environmental entrepreneurship and value creation<sup>25</sup> and are subsequently more successful at reaching environmental goals.<sup>26</sup> In a study of more than 10,000 individuals from 52 countries, women were found to be 1.17 times more likely than men to create social ventures than economic-focused ventures, and 1.23 times more

likely to pursue environmental ventures than economic ones.<sup>27</sup> The *2021 BMO Celebrating Women Grant Program* report examined more than 1,000 Canadian and American women-led SMEs focused on sustainability and advancing the UN's SDGs.<sup>28</sup> The study concludes that women entrepreneurs are “among the most active, resilient, and resourceful groups of entrepreneurs driving sustainable development in Canada and the U.S.”<sup>29</sup> Women entrepreneurs are an important asset in moving Canada toward net zero.

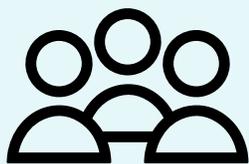
While women entrepreneurs play a vital role in Canada's transition to a net-zero economy, they often face challenges when seeking funding and the financing and support they need to succeed. There are also structural issues; for example, women-owned businesses are among the least capitalized and they often do not qualify for many loans as they tend to own smaller businesses with fewer employees.<sup>30</sup>



# Sustainability Framework for Small and Medium-Sized Enterprises

## Introduction

Achieving Canada’s net-zero goals requires change at the societal level in the form of new policies, programs, services and infrastructure, as well as a shift in values. It also requires organizations take concrete action informed by transition plans that identify high impact opportunities throughout their value chains. And, of course, we need to shift individual attitudes, knowledge and behaviour to encourage people to make responsible choices and use their sphere of influence—as leaders, workers or consumers—to move Canada toward its net-zero goals.



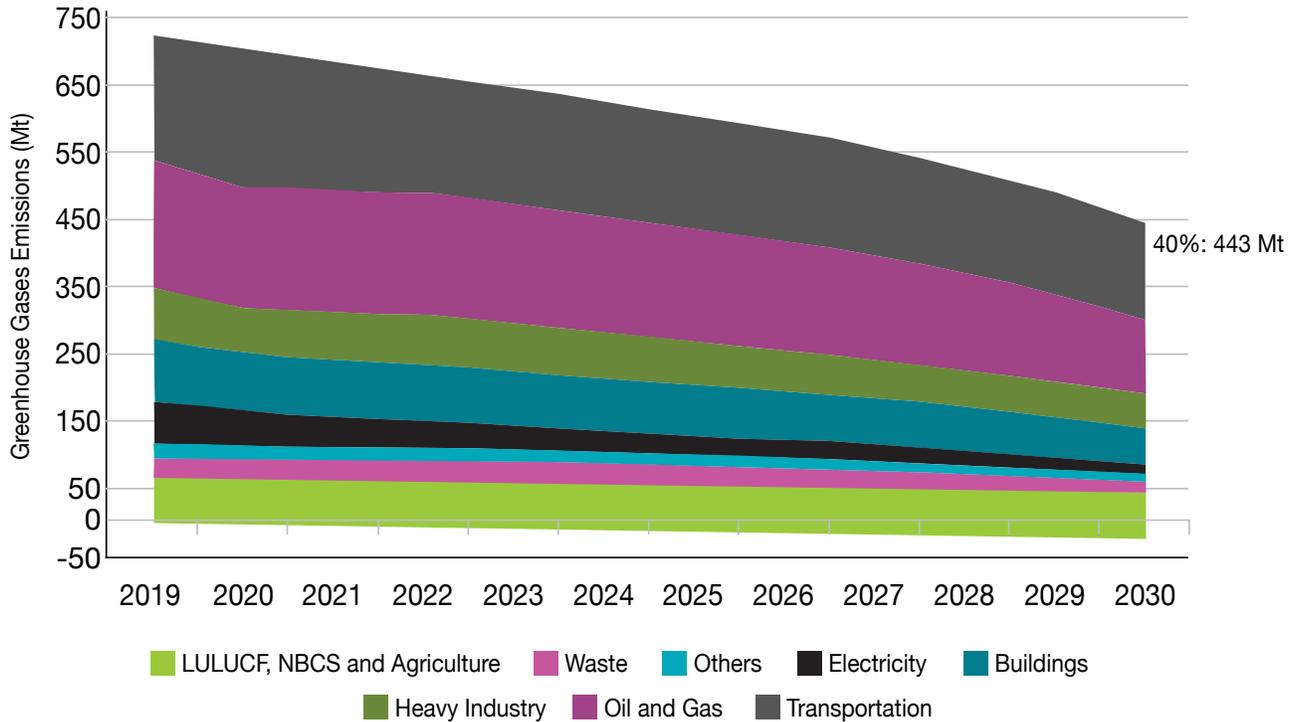
*We need to **shift individual attitudes**, knowledge and behaviour to **encourage people** to make responsible choices and use their **sphere of influence**—as leaders, workers or consumers—to move Canada toward its net-zero goals.*

## Macro level: sectoral focus

At the societal level, there are many forces shaping the drive to net zero. First and foremost is the increasing impact of climate change on the environment and the effects this is having on everything from migration patterns to insurance claims. Canada is, without question, being shaped by global environmental, economic, political, social, technological and cultural shifts and, in turn, is trying to create a context to drive the country toward its net-zero targets. Canada’s *2030 Emissions Reduction Plan* provides the overarching policy framework for the country’s emissions reduction actions up to the year 2030. External reviewers like the Canadian Climate Institute have indicated that it is a credible plan.<sup>31</sup> At the macro level, the government has a range of levers to make change, including taxation levels, industrial policy, communications strategy and more. Currently, much of the focus is on encouraging industrial sectors to adopt new strategies to reduce greenhouse gases.

**FIGURE 1**

**Pathways to 2030 from the 2030 Emissions Reduction Plan**



\* LULUCF stands for land use, land-use change and forestry; NBCS stands for nature-based climate solutions.

Source: Environment and Climate Change Canada. (2022) 2030 Emissions Reduction Plan. <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030/plan.html>

The plan aims to move Canada toward emission reduction targets of 40% to 45% below 2005 levels by 2030 by identifying eight primary economic sectors, calculating GHG emissions for each sector and modelling the effects of policy on each economic sector for each year until 2030 (Table 1). The eight sectors are buildings, electricity, heavy industry, transportation, nature-based solutions, waste, agriculture, and oil and gas.<sup>32</sup>



**TABLE 1****2030 Emissions Reduction Plan sector description**

<b>Sector</b>	<b>Description</b>	<b>Emissions in 2005 (million tons)</b>	<b>Emissions in 2019 (million tons)</b>	<b>Projected Emissions in 2030 (million tons)</b>
<b>Buildings</b>	Transition to a net-zero building stock through net-zero building codes, alternative forms of space and water heating, and energy efficiency.	84	91	37% below 2005 levels
<b>Electricity</b>	Move to net-zero electricity by 2035 with clean energy and infrastructure to connect regions with clean energy; this change will also reduce emissions in other sectors.	118	61	88% below 2005 levels
<b>Heavy industry</b>	Decarbonize large emitters and green Canada's mining sector.	87	77	39% below 2005 levels
<b>Transportation</b>	Reduce emissions with cleaner public transit, cleaner modes of travel, zero-emissions vehicles and active forms of transportation.	160	186	11% below 2005 levels
<b>Nature-based solutions</b>	Manage and protect Canada's land and water to remove carbon, which will bring benefits to society, like cleaner air, resilience and protection.	8.2 removed	9.9 removed	30 metric tons removed
<b>Waste</b>	Decrease waste-related emissions and move toward a circular economy to turn waste materials into raw materials.	31	28	49% below 2005 levels
<b>Agriculture</b>	Use agricultural lands to store carbon and adopt greener agricultural practices.	72	73	1% below 2005 levels
<b>Oil and gas</b>	Become the world's cleanest oil and gas producer and transition toward low-carbon and non-emitting energy products.	160	191	31% below 2005 levels

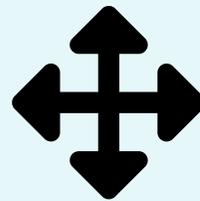
Source: Environment and Climate Change Canada. (2022) *2030 Emissions Reduction Plan*. [https://publications.gc.ca/collections/collection\\_2022/eccc/En4-460-2022-eng.pdf](https://publications.gc.ca/collections/collection_2022/eccc/En4-460-2022-eng.pdf)

Through these sectors, the Government of Canada articulates the basic sectoral categories under which net-zero initiatives will be classified and understood. Federal government funding and policies are also categorized under these sectors. Through policy, funding and as a vision for the economy, the *2030 Emissions Reduction Plan* influences organizations and individuals as they contribute to the net-zero economy; it also provides a macro-level frame for the activities of SMEs in developing their transition plans.

## Organizational level strategies

The practices of sustainable women entrepreneurs are made legible through the sectoral categories. As noted above, however, there are significant differences between the capacity, resources and expertise large corporations can devote to driving change and there is massive variation within sectors of the focus of transition planning. As a result, it is critical to enable and support individual organizations in developing and implementing relevant and feasible transition plans. Organizations across sectors can contribute to a net-zero economy by developing transition plans that integrate sustainability throughout their corporate strategy and across their value chain.

Climate transition plans highlight the concrete steps and actions that the organization needs to take to move toward alignment with climate science, while plans also provide organizational accountability.<sup>33</sup> Climate transition plans come in the context of increasing pressure from governments (e.g.,



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EU's European Sustainability Reporting Standards<sup>34</sup>) and from industry associations (e.g., Glasgow Financial Alliance for Net Zero<sup>35</sup>) for climate transition plan disclosures. Despite the attention, the record so far is mixed: the non-profit CDP released a study to see how many organizations have a climate transition plan. Of 18,600 organizations, 4,100 disclosed a climate transition plan aligning with the 1.5°C target, and only 81 had climate transition plans that aligned to CDP's 21 key indicators of a credible climate transition plan.<sup>36</sup>

The GHG Protocol identifies three “scopes,” which describe direct and indirect emissions sources. The scope system is often used as a valuable heuristic for transition planning. Scope 1 emissions refer to direct GHG emissions that occur from assets owned by an organization, like vehicles, equipment, and tools. Scope 2 emissions refer to indirect GHG emissions from the electricity that the company purchases. Scope 3 emissions

are the other indirect emissions that are due to activities of a company, like use of the company’s products and services by consumers.<sup>37</sup>

Export Development Canada and the Conference Board of Canada refer to GHG Protocol’s three scopes in their SME maturity framework, which measures the extent to which an SME is moving toward lower carbon emissions. There are five levels to the framework. Level 1 refers to organizations who are just getting started; the organization does not factor in GHG emissions into decision-making and does not have a carbon reduction goal. Level 2 is compliance: the organization has a reduction goal and makes some decisions to reduce emissions, and measures

Scope 1 and Scope 2 emissions. Level 3 is operational footprint strategy: the organization integrates GHG emissions reductions into decision-making and pursues actions like raising awareness on GHG emissions among company suppliers. Organizations meeting Level 4 in the framework undertake additional actions, like switching to renewable energy, purchasing carbon offsets and raising awareness on GHG with customers. Finally, Level 5 organizations have a net-zero ambition with net-zero targets, and measure Scope 1, 2 and 3 emissions.<sup>38</sup>

There are other frameworks: for example, the Glasgow Financial Alliance for Net Zero (GFANZ) identifies the most critical components for SMEs when developing transition plans.<sup>39</sup>

**TABLE 2**

Most critical components for small and medium-sized enterprises and companies starting to develop transition plans

Theme	Component	Perspectives From Financial Institutions
<b>Foundations</b>	Objectives and priorities	Helpful for understanding a company’s driving goals
<b>Implementation Strategy</b>	Activities and decision-making	Outlines a company’s actions and how it plans to implement its transition plan
	Products and services	Outlines how the company’s commercial activity supports the transition plan
<b>Metrics and Targets</b>	Metrics and targets	Outlines a company’s targets and enables tracking of progress and cross comparison
<b>Governance</b>	Roles, responsibilities and remuneration	Outlines the mechanisms in place to enable accountability and execution

Source: GFANZ. (2022). *Expectations for Real-economy Transition Plans*. <https://assets.bbhub.io/company/sites/63/2022/09/Expectations-for-Real-economy-Transition-Plans-September-2022.pdf>

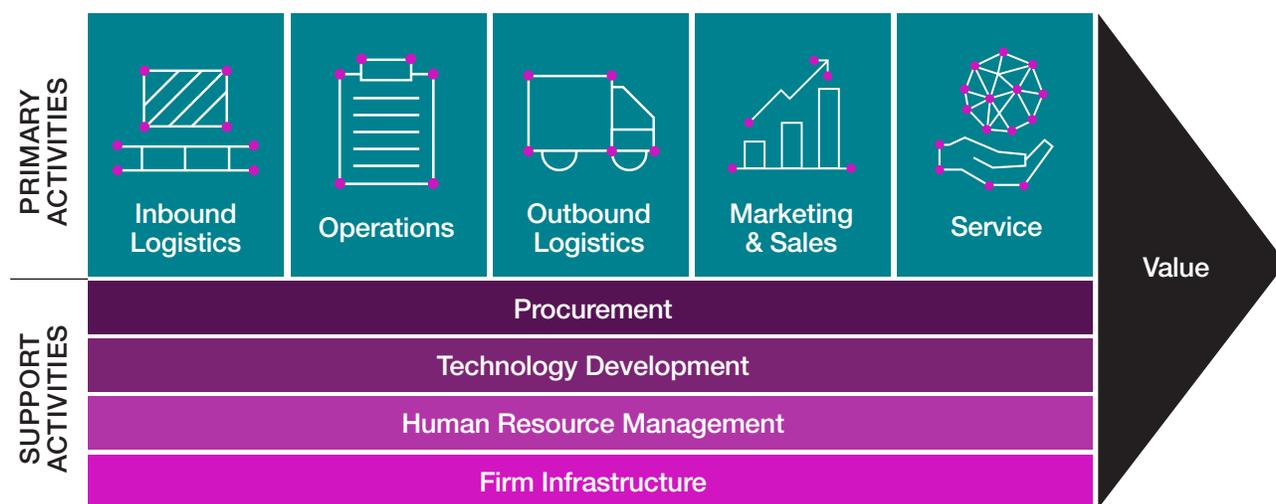
Integrating sustainability through the value chain is an important consideration for organizations that want to engage in greenification. According to the Carbon Disclosure Project, Scope 3 emissions—an organization’s indirect, upstream and downstream activities—account for an average of 75% of a company’s GHG emissions.<sup>40</sup> It is not enough for organizations to make piecemeal changes

to their activities; they must adopt a holistic approach throughout their value chains.

The value chain consists of primary and support activities. Primary activities consist of inbound logistics, operations, outbound logistics, marketing and sales, and service, which are the activities that turn inputs into outputs for customers.<sup>41</sup>

**FIGURE 2**

Value chain primary and support activities



### Sustainable value chain activities

Much of the focus of the net-zero strategy to date has focused on specific sectors and been dominated by large business. Discussions of entrepreneurship and SMEs have tended to focus on green tech startups and specific sectors, but the opportunity is much larger. By making conscious changes through the value chain, sustainable businesses make fundamental changes to their offerings and alter their value proposition for their customers. By doing so, sustainable

businesses can make a larger contribution to the entire value system and influence how other organizations construct their value chains. There are many ways that sustainable businesses can greenify the value chain; we explore some of the strategies below.



## **PRIMARY ACTIVITIES**

Inbound logistics refer to the sourcing of raw materials, services and resources required for the product or service.<sup>42</sup>

Sustainable businesses can decide to source environmentally friendly raw materials, services and resources and to seek local suppliers, reducing transportation costs and emissions. Choosing sustainable and renewable energy sources can also minimize an organization's carbon footprint.<sup>43</sup> Sustainable businesses can also consider shortening supply chains when sourcing goods and services, instead of seeking the most cost-efficient choice.

Operations refer to the processes of transforming inputs to the final product or service and organizations can cut costs and maximize efficiency in operations to reduce carbon emissions and waste.<sup>44</sup> This includes the design and the components needed to assemble physical products as well as services. Not only can organizations apply a sustainability lens to how they think of their products through the life cycle, but they can also take advantage of emerging consumer demands for new sustainable products. To do this, organizations must consider the environmental impact of products and services from creation to end of life. Design considerations are important; companies can design products, services and packaging that have a lower environmental footprint. Organizations can also see how their products might fit into a circular economy, for example, with opportunities to reuse or recycle.<sup>45</sup> Organizations can also analyze their products to determine whether they deliver societal and environmental value; analysis need not be confined to making

product processes more efficient.<sup>46</sup> Technology development can support the greenification of an organization's value chain. Technology can help companies coordinate their activities within the supply chain and support new, sustainable forms of manufacturing, like modular design. The Internet of Things can also help organizations improve manufacturing efficiencies by collecting data.<sup>47</sup>

Outbound logistics refers to the distribution and shipping of products or services.<sup>48</sup> In an organization's outbound logistics systems and processes, sustainable sources of transportation can be chosen, where possible; there may be a trade-off between delivery time and environmental impact, but this can be communicated to customers. Businesses may also consider prioritizing the local economy and local customers to reduce the carbon intensity of outbound supply chains.<sup>49</sup> Transitioning fleets to electric vehicles, developing shared distribution paths are among the approaches being used. Organizations can find efficiencies in distribution by switching to paperless processes and reducing packaging in transportation, whenever possible.

Marketing and sales activities refer to the presentation and communication of products and services to the target market.<sup>50</sup> Sustainability can be framed as an indispensable part of the product's value proposition and applied to marketing and sales. Sustainable approaches to product packaging, shifts from physical to virtual marketing and other strategies can be deployed, like favouring green products and services in marketing and sales activities over

other products and services. Additionally, organizations can use marketing and sales activities in an integrated communication strategy to engage in meaningful dialogue with their customers about sustainability.<sup>51</sup> Organizations can be transparent about the emissions profile of their products and create educational opportunities during interactions with customers. During this process, they will need to translate specialized knowledge and terminology into a language that others can understand.<sup>52</sup>

Sustainability can also be embedded into the ways in which companies provide services to support customers after sales. Businesses can look to minimize the carbon footprint of after-sales services by providing them online, on carbon-neutral web hosting platforms. Additionally, after sales activities are a key entry point for pursuing circular economy initiatives. Organizations can help customers with product disposal by creating recycling and reuse programs.

## **SUPPORT ACTIVITIES**

Firm infrastructure activities refer to the organization of a company, including activities like management, finance, planning and those related to the legal department, as well as activities related to top management, such as leadership.<sup>53</sup> A firm's infrastructure activities have implications for integrating sustainability throughout the company. Upper management and senior leaders play an important role in deciding the company's vision, strategy and goals. Leaders can purposefully integrate sustainability into the business from the very beginning.<sup>54</sup>

Additionally, firm infrastructure activities include functions like management, finance and planning, which will need to be oriented to sustainability. For example, instead of focusing performance management solely on financial goals, non-financial sustainability goals should also be measured, tracked and used as a standard for performance. Many large corporations have well-defined environmental, social and governance goals, which include firm commitments, metrics and accountability frameworks; however, this is less common among SMEs.<sup>55</sup>

Human resource management includes activities related to recruitment, training and development, and determining wages and benefits.<sup>56</sup> Employees and management play a critical role in the implementation of sustainability initiatives in organizations; for this reason, human resources play a pivotal role.<sup>57</sup> Sustainable

organizations need to ensure that their human resources activities—including job design, recruitment, retention, and employee training and development—can support their sustainability goals.<sup>58</sup> Recruiting and developing personnel with the right skills is particularly important given the novel business challenges facing organizations attempting to implement green measures.

Technology development includes the assets and activities related to product and service research and development, including technology support systems, software, design process, tools and equipment as well as basic infrastructure.<sup>59</sup> Technology support improvements through the value chain, but organizations need to consider how they manage and use technology. Organizations can encourage employees to adopt environmentally friendly behaviour for decreased energy consumption and resource



consumption, like setting their computers to sleep mode when they are not in use. Organizations can also make technology choices that support their operations while being as environmentally friendly as possible. This can include large and small actions, ranging from purchasing energy-friendly computers and reevaluating current data storage options, to purchasing smart power strips and other smart, environmentally friendly appliances in the office.

Procurement includes the assets and activities related to the acquisition of raw material inputs,<sup>60</sup> and can be greenified for a more sustainable value chain. Procurement is not just about finding cost-effective inputs; it is also about sourcing suppliers and partners that share common values with the organization. Businesses can use their purchasing power to reward organizations that pursue sustainability, working only with suppliers that are sustainable, fair and have a code of conduct and their own supplier vetting process.<sup>61</sup> Organizations can also collaborate with partners and suppliers to create closed product cycles, where products at their end of life are reused and recycled as inputs in another product.

By analyzing SMEs' greenification activities through the value chain, we can identify the structural changes that women greenpreneurs are making to their business models. We can also see how they are fundamentally changing their value proposition by modifying value chain activities, leading to upstream and downstream effects for other organizations in the entire value system.



*By analyzing **SMEs'** greenification activities through the value chain, we can identify the **structural changes that women greenpreneurs are making to their business models.***

## Individual level

Individual skills, education and experience, and personal attributes are the foundation of green transition plans. Organizations need access to the talent and competencies required to drive change and we need to mainstream sustainability across stakeholder groups ensuring policy makers, business owners, investors, consumers and others make decisions that advance the agenda.

## Conclusion

To advance the implementation of a net-zero strategy, we need to address actions at the societal, organizational and individual level with increased focus on the needs of SMES—the engine of economic development in Canada. Further, when we consider the needs of SMEs, we must also consider the particular roles of women entrepreneurs who account for a growing proportion of business owners in Canada.

# The Study Design

## Overview

Understanding the importance of engaging with SMEs to advance Canada's net zero goals and recognizing the growing importance of women entrepreneurs, this research study explores how women entrepreneurs are contributing to sustainability at the sectoral and organizational level.

The study consisted of one-hour one-on-one interviews with 43 women entrepreneurs recruited from a pool of women-owned Canadian businesses supported by Coralus, an organization focused on advancing majority women-owned enterprises and the sustainable development goals. We required that participants be the founder or co-founder of an SME, and that sustainability and reaching net zero be one of the goals of their company.

Interview questions were designed to uncover why women entrepreneurs value sustainability, best practices in implementing sustainability initiatives and how women entrepreneurs' businesses are contributing to Canada's net-zero goals. (See Appendix A for the full interview guide.) The interviews were transcribed, then reviewed by each interviewee to ensure accuracy. The information gathered during the interviews was supplemented with



*This research study explores how women entrepreneurs are contributing to **sustainability** at the **sectoral and organizational level**.*

desk research to gather a complete picture of each organization and their founders. The interviews and secondary research were then coded by two researchers against the sustainability framework outlined in the previous section focusing on the contributions enabled by the businesses' core strategy.<sup>i</sup> Where there were disagreements, researchers came to a consensus through a discussion. (See Appendix C: Case Studies for a full description.)

<sup>i</sup> For example, 100km Foods partners with local Ontario producers to bring their produce to local restaurants and consumers. The company was coded under the transportation sector because 100km Foods reduces the distance travelled in the supply chain as a result of their core business strategy. However, we did not code other organizations under transportation when they reduced their supply chain lengths if it was a secondary effort unrelated to their core strategy.

# Contributions of Women Greenpreneurs to Net Zero

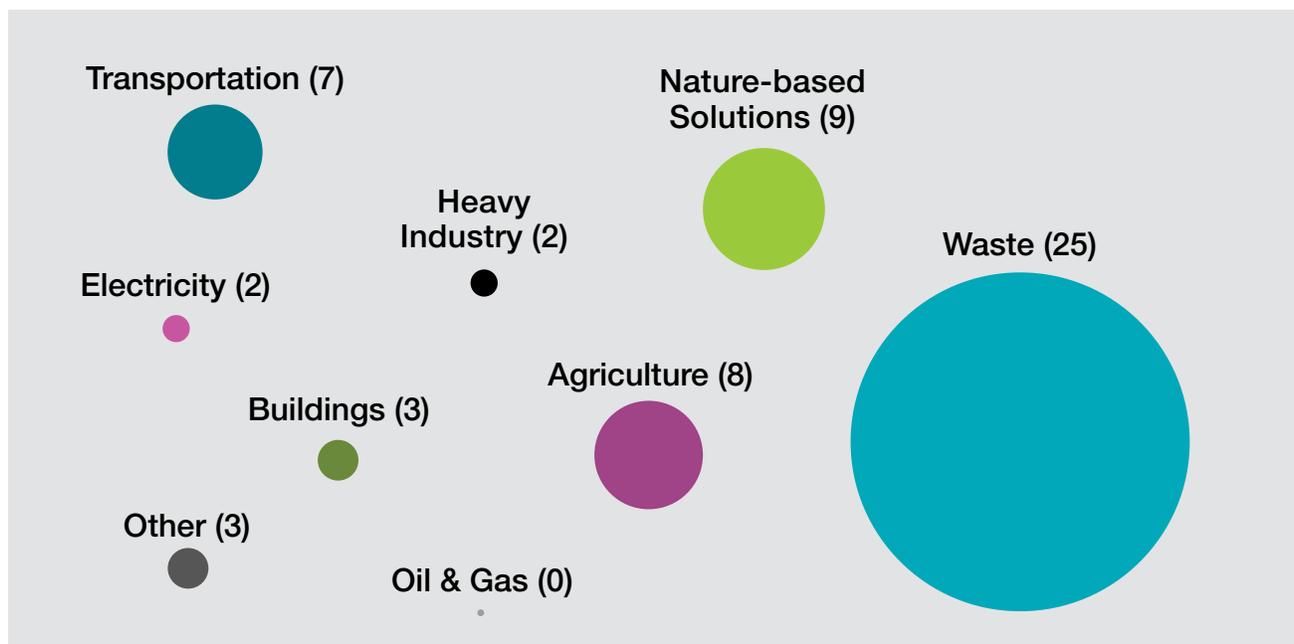
Interview results are described and discussed in the following section. We supplemented interviews with a review of publicly available documentation on the interviewed women entrepreneurs' ventures. Data and research material was analyzed using the Diversity Institute's sustainability framework (described in a previous section), through which we were able to understand better the contributions that women entrepreneurs are making to reach Canada's net-zero goals.

## Macro level

At the macro level, we assessed how women greenpreneurs were contributing to Canada's net-zero goals by organizing their contributions around the sectors in the 2030 Emissions Reduction Plan. The women greenpreneurs interviewed made contributions to a variety of sectors. The impacts were varied and included upcycling and repurposing materials, designing eco-friendly products and business processes, and water treatment technology innovations.

**FIGURE 3**

Women entrepreneurs' contributions to Canada's net-zero goals



Most of the women entrepreneurs interviewed made contributions to the waste sector with their businesses. None of the women entrepreneurs in this study were involved in the oil and gas sector.

## Organizational level

Women entrepreneurs interviewed for this study integrated sustainability across the value chain within their organizations, leading to innovative, sustainable value propositions. Table 3 shows how SMEs implemented innovations in each of the value chain activities to reduce their emissions.

**TABLE 3**  
Women entrepreneurs' innovations in the value chain

Value Chain Activity	Organizations Contributing to This Activity	Example of Key Innovations
<b>Inbound logistics</b>	100km Foods, Rewilding Water & Earth, Re4m Design & Fabrication, DreamRider Productions, Stormflow Surfacing, Ondine OceanFarm, Impact Zero, Beam Paints, Shoo-Foo Eco Linens, Road Coffee Company, Skipper Otto, The Tare Shop, Aisle, Aurora Heat, Grengine, RainStick, Aitken, Folds Wear, Remix Snacks, Made with Local, Earth & City, FreshSpoke	Rewilding Water & Earth sources from sustainable supplies where possible. For example, the company seeks forestry waste in large quantities to use as soil amendments in wetland restoration projects, which prevents it from being burned and fully avoids the emissions.
<b>Operations</b>	bFree, Dalcini, Brave Soles, Rewilding Water & Earth, Re4m Design & Fabrication, Technologies Ecofixe, DreamRider Productions, Stormflow Surfacing, Ondine OceanFarm, Impact Zero, Think Dirty, Beam Paints, Hydra Energy, Jack59, Shoo-Foo Eco Linens, Viridis Research, Road Coffee Company, 7 Leagues, Satya Organic, EcoAmmo Sustainable Consulting, Maven Water & Environment, Rewatt Power, Skipper Otto, The Tare Shop, Aisle, Aurora Heat, Grengine, RainStick, Abeego, Dispersa, Aitken Frame Homes, VL Energy, Folds Wear, African Bronze Honey, Hyon, Remix Snacks, Skwálwen Botanicals, Made with Local, Ocean Legacy, Korotu, Earth & City, FreshSpoke	Brave Soles is a sustainable, circular fashion company focused on using upcycled tires for the soles of our shoes and upcycled materials and leathers for all of their designs.

Value Chain Activity	Organizations Contributing to This Activity	Example of Key Innovations
<b>Outbound logistics</b>	bFree, Dalcini, Think Dirty, Jack59, Shoo-Foo Eco Linens, 7 Leagues, Skipper Otto, Aisle, Grengine, RainStick, Folds Wear, African Bronze Honey, Earth & City, FreshSpoke	Dalcini Stainless works with distributors in their outbound supply chain to reduce plastic packaging.
<b>Marketing and sales</b>	bFree, Maven Water & Environment, Skipper Otto, The Tare Shop, Aisle, Aurora Heat, Aitken, Earth & City	Earth & City strive to utilize biodegradable and compostable packaging, ensuring that customers are well-informed about proper disposal methods. This education is particularly important at farmers' markets, where they sell directly to customers.
<b>Services</b>	Rewilding Water & Earth, Shoo-Foo Eco Linens, The Tare Shop, Earth & City	Shoo-Foo Eco Linens ensures that they provide customer service in an environmentally friendly manner by hosting their website on a carbon-neutral platform.
<b>Firm infrastructure</b>	bFree, Dalcini, 100km Foods, Re4m Design & Fabrication, DreamRider Productions, Ondine OceanFarm, Impact Zero, Think Dirty, Hydra Energy, Jack59, Viridis Research, Satya Organic, Skipper Otto, the Tare Shop, Aisle, Dispersa, Folds Wear, African Bronze Honey, Remix Snacks, Ocean Legacy, Earth & City, FreshSpoke	FoldsWear has organizational values that align their operations to do right for the environment and for people. The value has trickled down into their communications and marketing and has influenced how they decide on investors.
<b>Human resource management</b>	Hydra Energy, 7 Leagues, EcoAmmo Sustainable Consulting, Ocean Legacy	Hydra applies a sustainability lens to hiring decisions. By collaborating with like-minded individuals, the company maintains a low staff turnover rate. Additionally, the company implemented biannual check-ins to assess employee and organizational adherence to their core values.

Value Chain Activity	Organizations Contributing to This Activity	Example of Key Innovations
<b>Technology development</b>	Rewilding Water & Earth, Technologies Ecofixe, Hydra Energy, Ocean Legacy, FreshSpoke	Ocean Legacy’s Legacy Plastic division uses technology to build capacity and infrastructure to gather plastics retrieved from the environment. Their in-house technology processes the plastics and is used to sell them as pellets to manufacturers as 100% recycled content.
<b>Procurement</b>	Dalcini, Brave Soles, 100km Foods, Beam Paints, Shoo-Foo Eco Linens, Road Coffee Company, Satya Organic, The Tare Shop, Aisle, Aurora Heat, African Bronze Honey, Remix Snacks, Made with Local, Ocean Legacy, Earth & City	When selecting suppliers, Satya Organic conducts thorough interviews to ensure that there is alignment in values.

While changing their value chain activities, the women greenpreneurs interviewed transformed the value system, changing other organizations’ value chains and making them more sustainable. Through their activities, sustainable businesses not

only contribute to innovations in their value chains, but they also contribute to the goal to attain a net-zero value system, changing the value chains of other organizations. Table 4 provides examples.

**TABLE 4**  
Women entrepreneurs’ contributions to a sustainable value system

Value Chain Activity	Organizations Contributing to This Activity	Example of Key Innovations
<b>Inbound logistics</b>	100km Foods, Beam Paint and Color, Hydra Energy	Hydra Energy reduces GHG emissions by 40% in Class 8 trucks using dual-fuel hydrogen technology, as opposed to diesel fuel, creating a low-emissions inbound logistics fleet.
<b>Operations</b>	Brave Soles, Re4m Design & Fabrication, Technologies Ecofixe, Stormflow Surfacing, Ondine OceanFarm, Viridis Research, 7 Leagues, EcoAmmo, Maven Water & Environment, Grengine, VL Energy, Hyon Software, Remix Snacks	Technologies Ecofixe solutions prevent GHG emissions by consuming less energy in operation, reducing electricity consumption by an average of 20%, and can be powered by solar energy.

<b>Value Chain Activity</b>	<b>Organizations Contributing to This Activity</b>	<b>Example of Key Innovations</b>
<b>Outbound logistics</b>	100km Foods, Hydra Energy, Skipper Otto	100km Foods brings local, farm-fresh foods directly to chefs and consumers, avoiding 92% of the distance that food has to travel.
<b>Marketing and sales</b>	Skipper Otto, The Tare Shop, Think Dirty	Skipper Otto spends time and resources on consumer education to educate consumers on what sustainable seafood means. Their business model does the marketing and consumer education on behalf of their suppliers.
<b>Service</b>	Tare Shop, Skipper Otto	The Tare Shop offers a zero-waste approach to retail, leading to low emissions customer service on behalf of their suppliers.
<b>Firm infrastructure</b>	Impact Zero, Rewatt Power, VL Energy	VL Energy is a consulting company helping companies measure and report on their emissions. They are also a cleantech company commercializing predictive emission measuring and monitoring software using AI. VL helps organizations monitor, track and improve on their industrial emissions so companies can plan effective mitigation strategies.
<b>Human resource management</b>	DreamRider Productions, Impact Zero	Impact Zero helps potential sustainable entrepreneurs to grow Canada's environmentally sustainable entrepreneurship ecosystem. Impact Zero helps sustainable entrepreneurs develop human resources capacity for their organizations.

Value Chain Activity	Organizations Contributing to This Activity	Example of Key Innovations
<b>Technology development</b>	Technologies Ecofixe, Maven Water & Environment, Rewatt Power, VL Energy, Hyon Software, Korotu, FreshSpoke	Hyon's platform helps organizations find new homes for end-of-life assets, often within the same company, preventing landfills and further consumption of virgin materials for replacement products.
<b>Procurement</b>	Think Dirty, Ocean Legacy, Fresh Spoke	Think Dirty is an app that provides transparency to consumers about the ingredients in their personal care and home products. It features brands without toxic and carcinogenic chemicals, featuring products with ingredients that are safe, environmentally conscious, and non-exploitative. This helps like-minded organizations with their procurement efforts.

The women greenpreneurs interviewed show that they are innovating by integrating sustainability. While they did not employ academic and specialist terms to describe their efforts, they are re-evaluating and innovating on the traditional business model by integrating sustainability throughout the business. They are showing that they are in the business of sustainability, and not just in sustainability for the business. Women entrepreneurs are also leading sustainable innovations throughout the value chain, leading to a more sustainable value system overall.

## Individual level

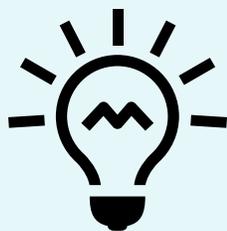
In considering women greenpreneurs' knowledge, skills and attitudes, we considered how they perceived their skills, education, work experience and personal attributes.

## Skills

The women entrepreneurs interviewed rarely brought up the importance of technical skills; instead, they discussed the importance of other skills. We identified one such category as social-emotional skills, which includes skills that women entrepreneurs identified as important, like relationship building, communication and collaboration, which are essential for effective working relations with external stakeholders (e.g., suppliers) and employees. For example, one woman entrepreneur explained that she took her time to communicate effectively with her customers to understand their challenges and what success looks like for them so that her business could offer the right interventions.

We identified another group of important skills and organized them under the heading of entrepreneurial skills. These skills helped

the women entrepreneurs navigate difficult circumstances during their entrepreneurial journey. Frequently mentioned skills in this category included resiliency, perseverance, leadership and networking. Women entrepreneurs stated that they needed these entrepreneurial skills to lead their enterprises during difficult circumstances. As one entrepreneur said, “You have to be strong, courageous and truly believe in your project. And you will receive much more ‘nos’ than ‘yesses.’ You have to be resilient.” Entrepreneurial skills were also important for helping interviewees find and take advantage of new opportunities in the market. For example, some participants noted the importance of collaboration and networking for building a community and a support network, given the lack of available information and mentorship on building a sustainable business. One entrepreneur shared the following: “I’m finding that the community is growing, and there’s a lot of support within other local businesses who are also pursuing these sustainable initiatives. And everyone kinda wants to work together



*You have to be **strong, courageous and truly believe in your project.** And you will receive much more ‘nos’ than ‘yesses.’ You have to be resilient.*

and see what resources they have to share.” The importance of entrepreneurial skills is not limited to sustainable women entrepreneurs; there is a large body of research on entrepreneurial skills in the literature.<sup>62</sup>

The women greenpreneurs interviewed also mentioned other skills, including systems thinking, project management, project planning and research skills.

## Education and work experiences

The women entrepreneurs interviewed came from a wide range of educational backgrounds and had varied work and volunteer experiences. Entrepreneurship is linked to science, technology, engineering and mathematics (STEM) in the popular imagination,<sup>63</sup> but these women entrepreneurs demonstrate that STEM backgrounds are not required for success in sustainability. Sustainability benefits from a diversity of perspectives; as one woman entrepreneur recounted: “Fourteen years of working with a non-profit, community-based non-profit, and working with the public, with landowners around stewardship and species at risk. And ... that’s where I developed project management skills and ability to take an idea ... and go out and get the funding for it. I mean, having to scramble for funds in a non-profit really taught me a lot about how to get, you know, how to make an idea happen; right?”

Some of the women entrepreneurs benefited from formal education in sustainability and the environment; others learned from previous working experiences. One interviewee had a background in ecology. However, not all women entrepreneurs interviewed had adequate knowledge

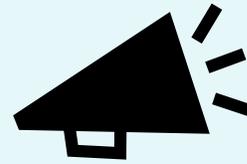
about sustainability and the environment, which was important for the success of their ventures. In response, several women entrepreneurs spoke about learning on the job through self-study. One participant noted: “It’s also been a commitment to learning ... a new language. Learning how to apply the understanding of what sustainability is to a new industry, it’s some education and some learning.” This was particularly the case for the interviewees given the abundance of specialized knowledge in the space and the innovative technologies that continue to develop.

## Personal attributes

The women entrepreneurs interviewed for this study had a set of common shared personal attributes and characteristics. Two attributes were mentioned frequently: care for the environment and strong values.<sup>i</sup>

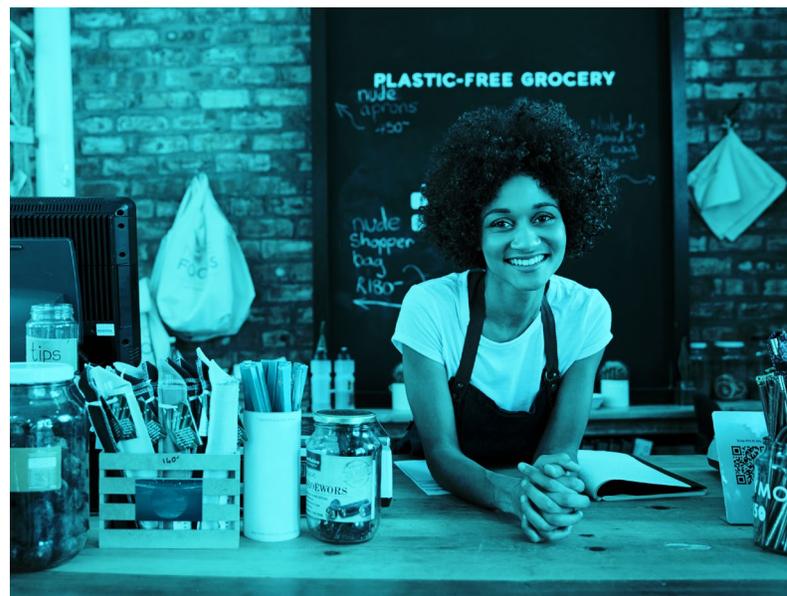
Several women entrepreneurs spoke explicitly about how they care for, appreciate or are interested in nature and the environment. One interviewee described her affection for nature in this way: “My mom especially loves the outdoors. [We would] spend entire summers camping out in Prince Edward Island. [It’s also] just my own love of nature and love of being outside and realizing, oh, actually, humans are not meant to live in little boxes, with poor air

<sup>i</sup> The women entrepreneurs expressed the equivalent of these terms in several ways. What we term as “care for the environment” includes what the women entrepreneurs articulated as “deep connection to nature,” “appreciation for nature,” “appreciation for the environment” and other similar phrases. What we call “strong values” includes articulations like “conviction,” “persistence,” “purpose” and “strong sense of values.”



*We need people to wake up to the fact that what we’re doing with this **destructive consumerism** is harming the earth.*

quality and windows. So, my own love of the outside and nature and then adding to that my own ecological education through my formal studies. I like the quote from ... Aldo Leopold, who said [something to the effect of], ‘To have an ecological education is to live alone in a world of wounds.’” For many participants, their special connection with nature furnished them with motivation for their sustainable enterprises—the women saw the intrinsic value of protecting nature.



As one woman entrepreneur put it: “We need people to wake up to the fact that what we’re doing with this destructive consumerism is harming the earth. People need to wake up to that, to choose products that do not harm the earth, and have a connection to the rest of the world [and] nature. We’re a part of it, so we have a relationship with animals, and we have a responsibility to protect the environment in which they live. People don’t seem to realize that [when] you protect nature for animals, we’re protecting the earth for ourselves. So, if we take care of the land, we’re taking care of ourselves.”

Women entrepreneurs often face an entrepreneurial ecosystem that does not have a framework to understand the sustainability-focused work that they want to do. For interviewees, their core values played a pivotal role in withstanding pressures from the entrepreneurship ecosystem and were integral for orienting their organizations. As one entrepreneur said, “I think internally you have to stand up for the values you believe in. You have to stick with your principles; you cannot be swayed by other factors. You

have to be strong and just know this is what you wanna do and you won’t be pressured by your board or your investors. If there’s a certain value or company mission that you have to follow, you don’t get pressured easily by other people.”

Many entrepreneurs shared the conviction that environmental sustainability cannot be separated from social sustainability. They emphasized the triple bottom line: many of the women entrepreneurs interviewed consciously adopted a sustainable business model that aims to produce not just economic profit, but also contribute to social and environmental goals. One entrepreneur commented that “[Sustainability] goes through absolutely every level of the business because it’s the core focus of what we do. So, we have business systems everywhere, from boats, all the way to the end consumer, where we are thinking about what are the best sustainability practices in terms of carbon, waste, plastic, marine impacts, bycatch, you know, all those kinds of things. So, at every level, we have processes built to make sure that we are monitoring those environmental impacts and then that we are innovating; we’re always innovating on how to reduce those.”

Some women entrepreneurs were critical of previous business models and the status quo; namely, the idea that businesses are only there to maximize economic goals. As one woman entrepreneur said in her interview: “I’m coming ‘round to saying that one of my concerns if I just look big picture at everything right now, is that it feels like people are trying to find ways to accelerate green business, or scale sustainability,



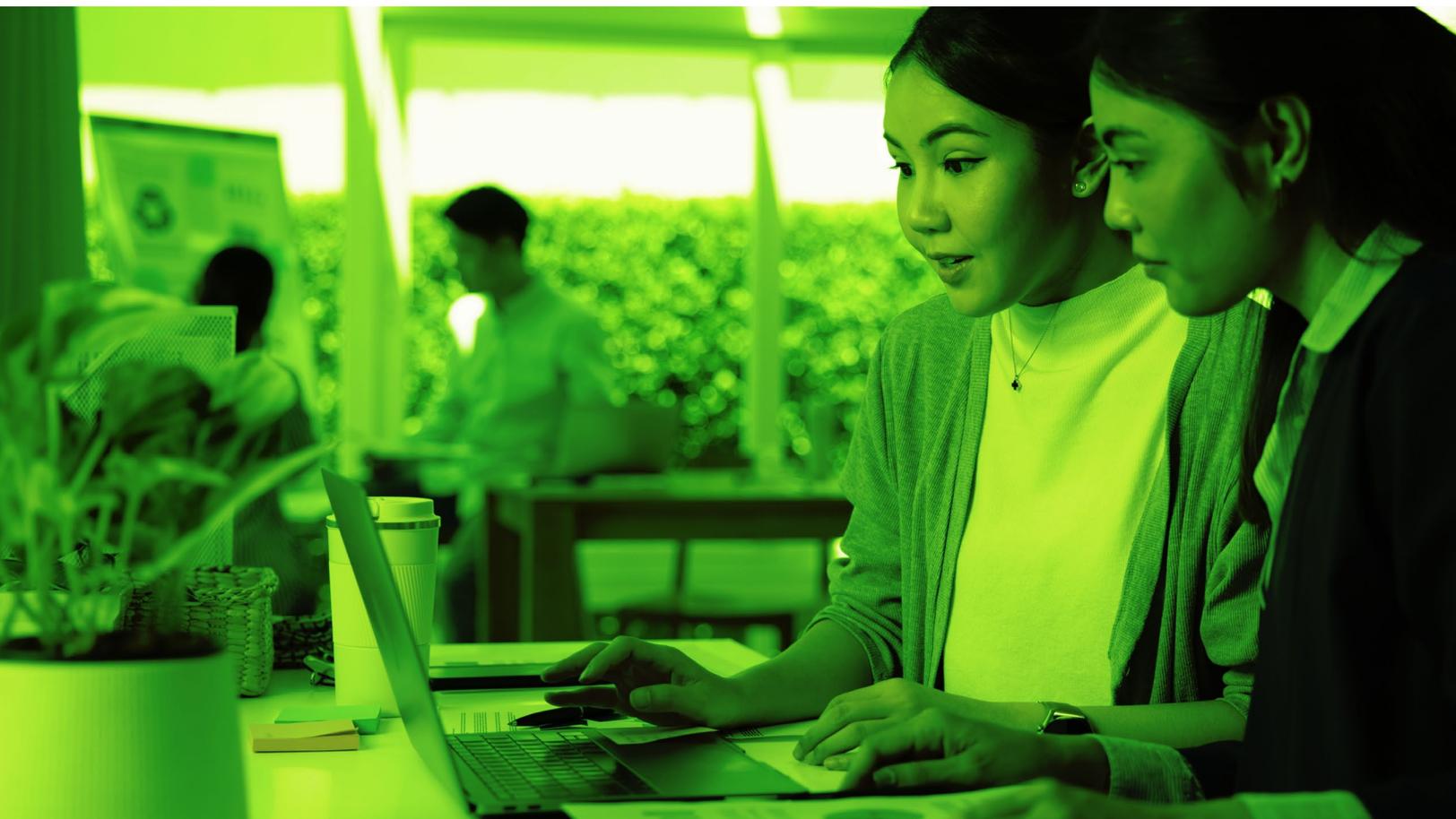
*Sustainability goes through absolutely every level of the business because it’s the **core focus** of what we do.*

and in other words, we're trying to feed social entrepreneurship through the same hyper-growth hockey stick ... . I think we need to stop celebrating those business models or holding them up as this is the holy grail of entrepreneurship ... we need to not accelerate things, we need to slow them down ... . The whole hustle culture is responsible for environmental degradation, and I just don't think it's necessary; I don't see why every business needs to scale to infinity; it's ridiculous."

Instead, many of the women entrepreneurs interviewed pursued sustainability goals often at the expense of profitability and other economic goals. They did this despite the additional difficulties that their business goals brought them, especially in terms of finding alignment with the entrepreneurship ecosystem. One entrepreneur discussed

these difficulties saying, "a business who's just starting out ... knows the cheapest option makes them the most money. Of course, they're gonna do it if that's their mindset, right? They've got stakeholders, if they need to stay in business, you know. But that's annoying because the ones who are working at it and doing our best and care and are making a difference for the future, there's nothing there as an incentive except knowing you can go to bed at night feeling like I've done my part."

At the micro level, we see how individual women entrepreneurs matter. Their skills, education, working experiences and personal attributes have contributed to the creation of sustainable enterprises (meso level) and, ultimately, will contribute to Canada's goal of achieving a net-zero economy at the macro level.



# Conclusions and Recommendations

As Canada moves toward a net-zero economy, it is vital to mobilize SMEs in the transition. To address climate change, all organizations, including SMEs, must work to adopt sustainability at every step of the value chain. Given their orientation toward sustainability, women entrepreneurs will play an important role in this transition.

The sustainability transition also presents opportunities to improve operational efficiencies to reduce GHG emissions and save costs while also creating a more inclusive workforce to spur innovation.

For this study, our team interviewed 43 women entrepreneurs to fill in the research gaps, hear their stories and see how they are contributing to the net-zero economy. Using this primary data, along with secondary research, we used the Diversity Institute's sustainability framework to analyze their contributions to Canada's net-zero goal.

At the macro level, we found women entrepreneurs contributing to key sectors as articulated in the 2030 Emissions Reduction Plan. At the meso level, women entrepreneurs are making contributions to net zero by adopting business models that centre core activities around sustainability initiatives. Their ventures are also innovating across the value chain, leading to positive spillover effects in the entire value system. At the micro level, we see how individual agency and an entrepreneur's skills, education, work experience and personal attributes shape their desire to contribute to the net-zero economy.



Based on our findings, we provide a summary of lessons learned and recommendations for policy makers, investors and other stakeholders interested in promoting a sustainable and equitable economy:

1

A net-zero economy will not be created through capital-intensive, technological development alone. The processes of driving the transformation to net zero, like the transformation associated with digitization, requires attention to adoption of new policies, processes and behaviour throughout the ecosystem.

2

Despite the important role that SMEs play in the Canadian economy, there is less focus on their role in the transition to net zero, beyond green tech, as targets for and drivers of “greenification.”

3

The contributions of women entrepreneurs and other diverse entrepreneurs are often overlooked. Building on previous work, this study documents valuable contributions they make to the transition, across sectors and at various stages in the value chain.

4

A wide range of skills is required for sustainable entrepreneurship. Training and support programs cannot just focus on technology skills for developing sustainable entrepreneurship.

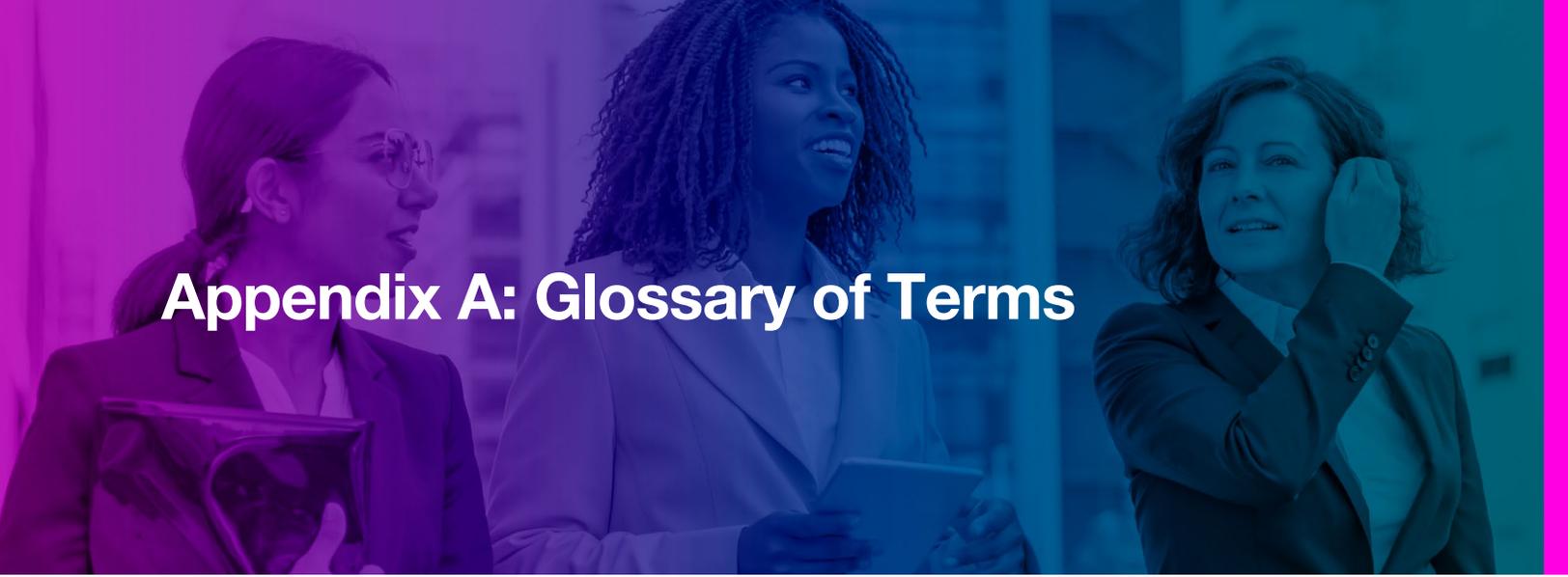
5

There is a lack of information, knowledge, mentorship and supports for SMEs who want to greenify their operations. Those who pursue the path of sustainable entrepreneurship are forced to learn everything by themselves.

To achieve the shared goals of government, industry and communities, we need to understand the importance of innovation processes beyond technology and the need to understand drivers and impediments to “greenification” at the societal, organizational and individual levels.

We also need to remember that, while some sectors are priorities for good reason, all sectors will need to adapt. As most private

sector jobs in Canada rest with SMEs, it is critical to understand their role as drivers and adopters of environmentally responsible practices. In particular, we need to understand the role women entrepreneurs can play in the transition and ensure that they have the supports needed. We also need to provide support to SMEs in transition and to ensure that the people with the skills needed to support them are trained and available.



## Appendix A: Glossary of Terms

**Cleantech products or services:** Any good or service designed with the primary purpose of contributing to remediating or preventing any type of environmental damage; any good or service that is less polluting or more resource-efficient than equivalent normal products which furnish a similar utility. Their primary use, however, is not one of environmental protection.<sup>64</sup>

**Environmental, social and governance (ESG):** A set of practices used to evaluate a company's operational performance as it relates to social and environmental impact. This evaluation can be done internally or externally by investors or other stakeholders.<sup>65</sup>

**Equity, diversity and inclusion (EDI):** The principles and practices that promote fairness, respect, and equal opportunities for all individuals regardless of their gender, race, ethnicity, sexual orientation, or other characteristics.<sup>66</sup>

**Greening:** The process of pursuing knowledge and practices to become more environmentally friendly, enhance decision-making and lifestyle in a more ecologically responsible manner, that can lead to environmental protection and sustainability of natural resources for current and future generations.<sup>67</sup>

**Greenpreneur:** Entrepreneurs in any sector that are applying their skills to environmentally sustainable issues and the push to net-zero emissions. They are growing across all sectors in Canada, and women are more likely to pursue enterprises with sustainability goals, as are Indigenous Peoples.<sup>68</sup>

**Inclusive innovation and entrepreneurship ecosystem:** The complex relationships between various factors and entities within a given system. The ecosystem model consists of three levels: macro/societal, meso/organizational and micro/individual.<sup>69</sup>

**Net zero:** The economy either emits no greenhouse gas emissions or takes action to offset its emissions (e.g., carbon capture technologies).<sup>70</sup>

**Small and medium-sized enterprises (SMEs):** Companies with a workforce of between one and 499 employees.<sup>71</sup>

**Sustainability:** A fundamental concept related to how goods are produced and consumed and how services are delivered that requires transforming our economic system in a way that satisfies our present needs without compromising the ability of future generations to fulfil their own needs.<sup>72</sup>

**Sustainable entrepreneurship:** The development of new businesses that prioritize environmental sustainability as a core value proposition.<sup>73</sup>

**Triple bottom line:** An approach to sustainability that integrates environmental health and integrity, social equity and cultural well-being, economic prosperity and fiscal responsibility, and good governance into decision making, producing equitable solutions and avoiding undesirable trade-offs.<sup>74</sup>





# Appendix B: Interview Guide

1. What opportunities does sustainability offer your business? How do you (did you?) identify them?
  - a. **Probe:** What opportunities will sustainability offer your business in the future?
2. Why is sustainability important to you?
  - a. **Probe:** Why is it important to you? Your business? Your customers? Your employees?
3. What is the sustainability standard for your industry?
  - a. **Probe:** How are these standards set? How did you learn about them? How do you meet them?
4. What are the sustainability best practices for your business?
  - a. **Probe:** What are the best practices internally? And externally?
5. What is the impact of your business on helping Canada reach their net-zero goals for 2050?
  - a. **Probe:** How is this impact measured? What resources do you need to increase it?
6. In your role, what are the skills necessary to make green entrepreneurship successful?
  - a. **Probe:** Are there any skills that you think would be particularly helpful for women entrepreneurs in this space? Digital skills?

7. How did you develop the necessary skills to succeed in the green industry?

**a. Probe:** Education, work experiences, mentorship

8. What are some of the barriers you have had to overcome in the green industry as a women entrepreneur? What are some of the enablers?

9. What are some of the challenges in reaching your sustainability goals? What are some of the enablers?

10. What supports and recommendations would you offer to other similarly-sized businesses in order to help them achieve their sustainability goals?

**a. Probe:** How would your advice change for different sectors?

11. What were some agencies, programs, or other support systems you found helpful in your journey to becoming a women entrepreneur in the green industry?

**a. Probe:** Funding agencies, networking programs, mentorship, advocacy groups, conferences, training workshops. How did you identify them?

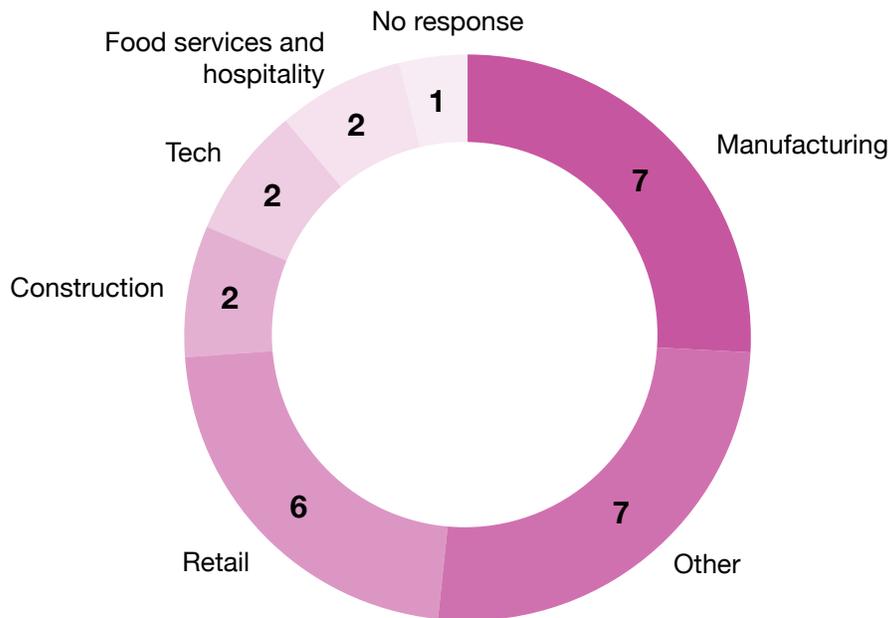
# Appendix C: Description of the Participants

For the interview portion of the study, we recruited 43 women founders, co-founders or business leaders that focus on environmental sustainability. The participants were identified through various means. Before the interview, each participant was sent an optional survey aimed at gathering

information about their demographic background and business. This step was taken to understand better the interview pool for the project. Of 43 women entrepreneurs, 27 responded to the survey. Figures 3 to 8 summarize the results.

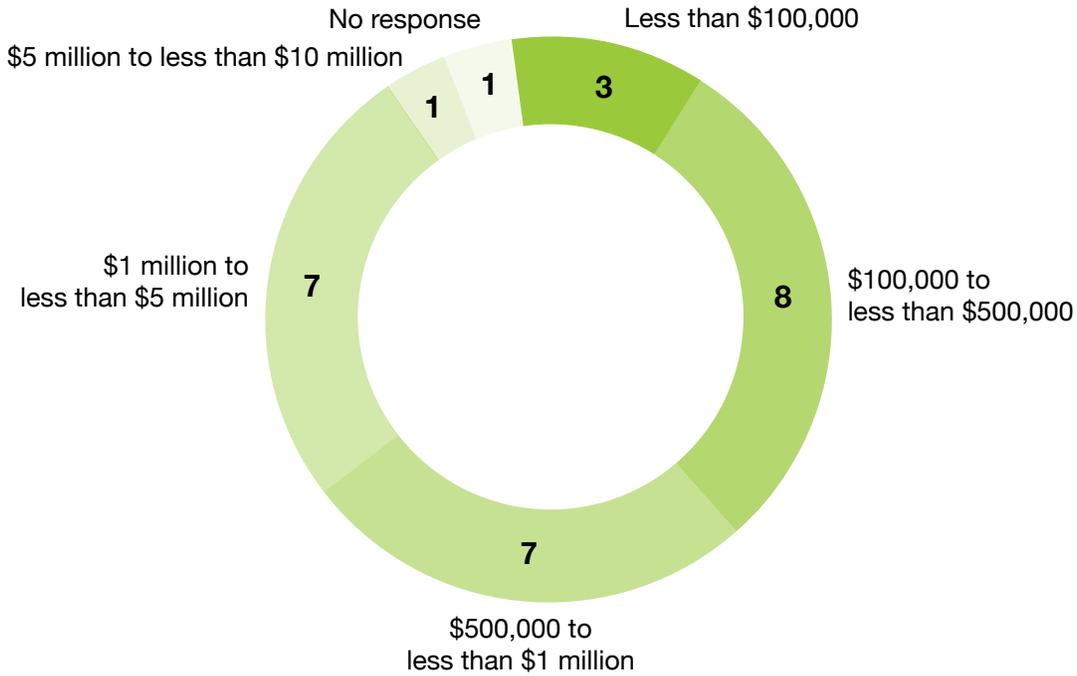
**FIGURE 4**

Survey responses to the question, “What industry does the organization operate in?”



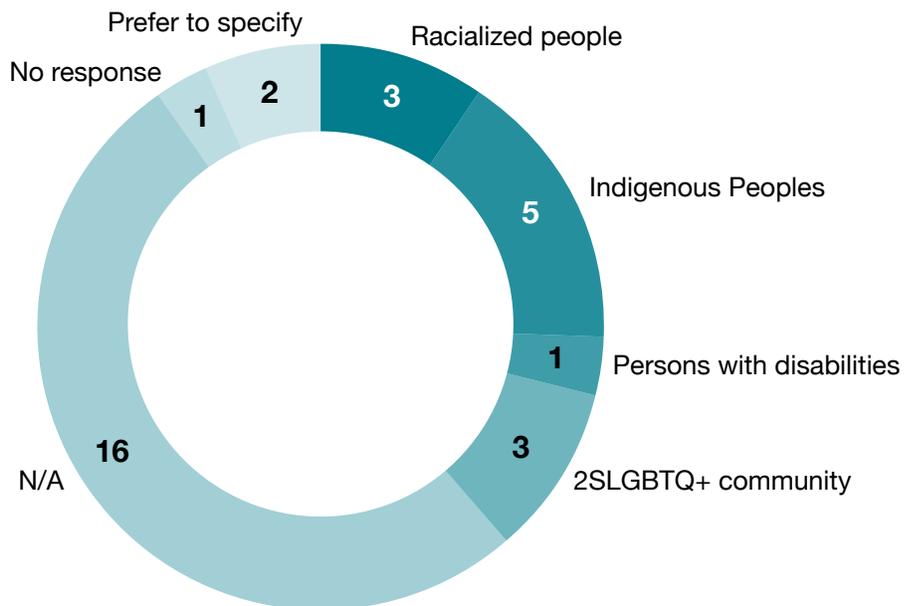
**FIGURE 5**

Survey responses to the question, “What is the organization’s annual revenue or operating budget for the most recently completed fiscal year?”



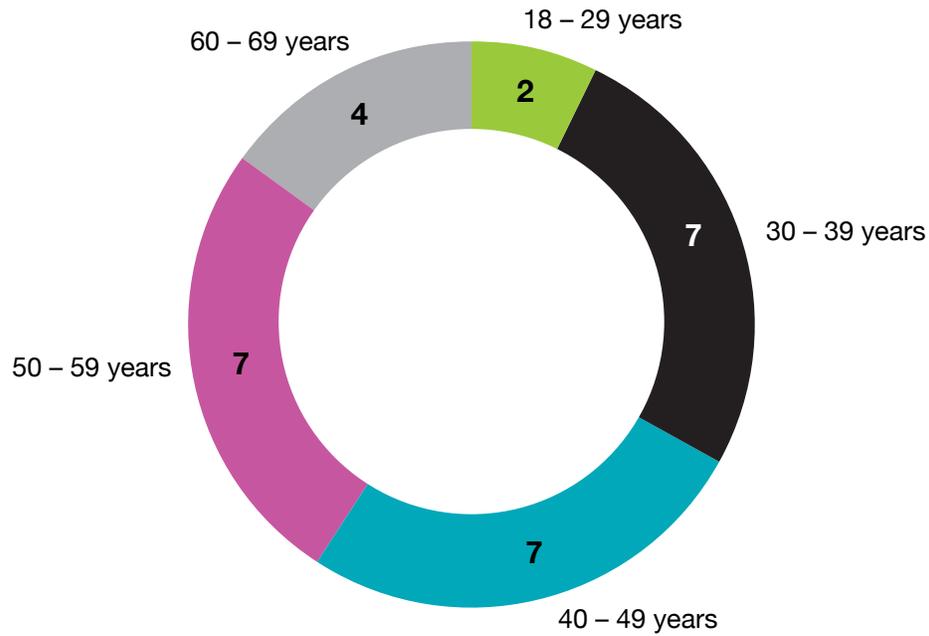
**FIGURE 6**

Survey responses to the question, “Do you identify yourself with the following groups? [Select all that apply]”



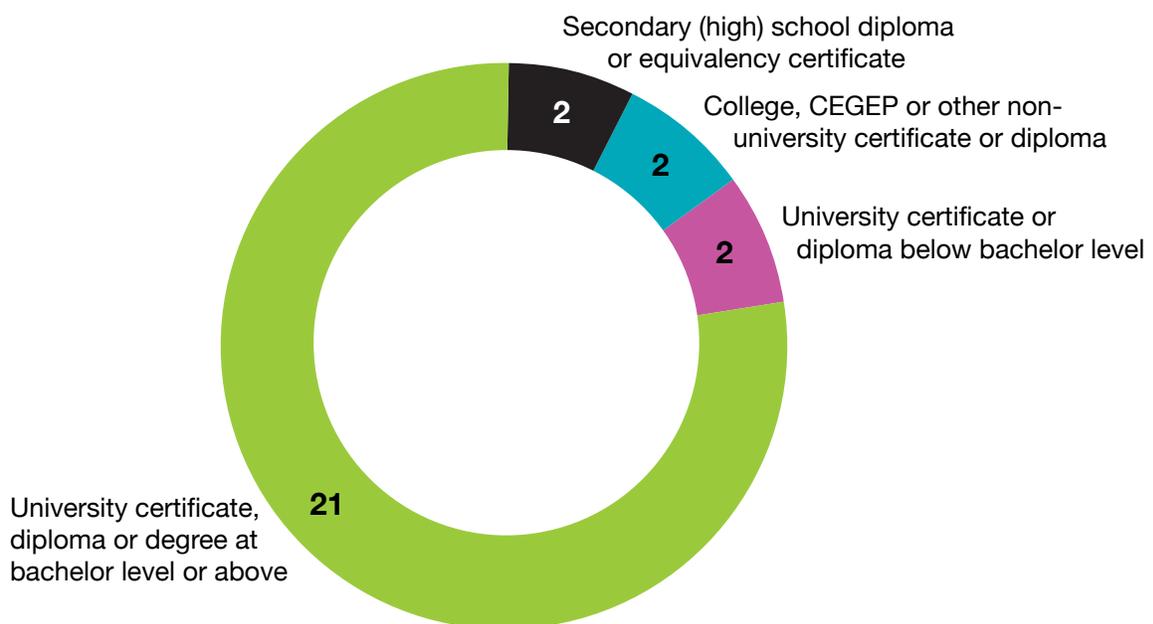
**FIGURE 7**

Survey responses to the question, “What is your age?”



**FIGURE 8**

Survey responses to the question, “What is your educational level?”



# Appendix D: Women Entrepreneurs Profiled

To read case studies of the businesses of the women entrepreneurs profiled, visit [greenentrepreneurship.coralus.world/](https://greenentrepreneurship.coralus.world/) (available in English only).

Name of Organization	CEO	Description
<b>7 Leagues</b>	Tasha Nathanson	7 Leagues is an innovative company focused on sustainable leather production and the development of natural, tannin-based eco-friendly fish leather upcycled from skins, which are the by-products of food production. Fish leather has nine times the tensile strength per thickness as mammal leather, and there are potential applications in ethical fashion.
<b>100km Foods</b>	Grace Mandarano	100km Foods was founded in 2014 by Grace Mandarano and Paul Sawtell to support the local food industry in Ontario. The North York-based company partners with local Ontario producers to bring farm-fresh goods directly to local restaurants and consumers. It specializes in the sale and distribution of local, sustainable foods, with a comprehensive offering of fresh produce.
<b>Abeego</b>	Toni Desrosiers	Abeego fights food waste with breathable, reusable food wrap. The natural coated food wrap, known as beeswax wrap, keeps food fresh for longer. It is an all-natural, non-toxic, compostable solution to protect the health of people and the planet.
<b>African Bronze Honey</b>	Liz Connell	African Bronze Honey is a social impact company that, on its surface, is a honey importer. The honey is harvested in southern Africa as part of a project to protect forests from being cut down, providing jobs to locals who become beekeepers. The bees are kept according to regenerative organic principles in the wilds of the forest with no pesticides, herbicides or insecticides.
<b>Aisle</b>	Madeleine Shaw	In 1993, Aisle was one of the first companies to bring modern reusable period products to consumers and has been innovating ever since. Their high-performance products feature absorbency properties superior to disposable options. Aisle has led and participated in dozens of menstrual health and equity programs in 17 Global South nations, as well as in Canada, focusing on the needs of marginalized populations.

Name of Organization	CEO	Description
<b>Aitken Frame Homes</b>	Kim Aitken	Aitken Frame Homes is a building innovation company bringing attainably priced and affordable-to-operate homes to consumers in Canada and abroad. The company provides a sustainability standard several years ahead of current building codes to help consumers save water and conserve energy in a non-toxic environment.
<b>Aurora Heat</b>	Brenda Dragon	Aurora Heat combines traditional Indigenous ways with practical functionality to deliver sustainably sourced, natural warmers for hands, feet and body. Their feel-good warmers are long-lasting body heat solutions that are 100% biodegradable with a lifespan measured in years, if not decades.
<b>Beam Paints</b>	Anong Beam	Beam Paints was founded in 2016 as the first plastic- and petroleum-free arts and crafts supplier in the world. Beam Paints was inspired by Indigenous culture. With its Indigenous paint tradition, it seeks to celebrate the colours of the wide world with the intimacy of the northern forest.
<b>Bfree</b>	Leisa Hirtz	Bfree creates antibacterial, medical-grade silicone menstrual cups that don't require boiling to sanitize. The Bfree cup only requires wiping down after each use. This unique characteristic makes it easy to use, completely reusable and environmentally friendly.
<b>Brave Soles</b>	Christal Earle	Brave Soles is a sustainable, circular fashion company focused on using upcycled tires for the soles of their shoes and upcycled materials and leathers for all of their designs. The company has upcycled 3,466 tires to date. For Brave Soles, it is as important for the items to be fashionable as it is for their products to be responsibly sourced and produced; it works with local artisans in the Caribbean to make their goods.
<b>Dalcini Stainless</b>	Nita Tandon	Dalcini Stainless responsibly manufactures beautiful, long-lasting stainless-steel food storage containers that are highly functional, low-maintenance and can be put in the freezer, the oven or the dishwasher. The containers are free of any toxicants, rust-proof and infinitely recyclable with a lifetime warranty.
<b>Dispersa</b>	Nivatha Balendra	Dispersa is a clean biotechnology organization tackling two challenges: food waste and chemical-based surfactants found in most cleaning and personal care products. Dispersa's naturally fermented biosurfactants produce the same molecules as conventional, more polluting processes. They are non-toxic and effective while being safe for people and the planet.

Name of Organization	CEO	Description
<b>DreamRider Productions</b>	Vanessa LeBourdais	DreamRider engages elementary school kids with meaningful, fun experiences to activate lasting behaviour changes in four key areas: climate change, water conservation, waste reduction and disaster preparation. DreamRider inspires young citizens to become changemakers for the environment in their families and communities, often for life.
<b>Earth &amp; City</b>	Ashley Sweetman	Earth & City makes and sources local food in Ontario. They bring in fresh, quality foods produced from local, smaller farms to urban customers, and make vegan, gluten-free crackers using leftover pulp from a local juicer.
<b>EcoAmmo</b>	Stephani Carter	EcoAmmo was founded in 2006 to help the world transition toward environmental and social sustainability. The company is a green building design, construction and project management organization. It helps businesses define and implement sustainability and trains high-performing, strengths- and values-based teams and businesses to be innovative market leaders.
<b>Folds Wear</b>	Nina Kharey	Folds Wear is a technology company operating at the intersection of medicine, fashion and sustainability, with a mission to do no harm. Folds Wear designs high-performance medical scrubs to solve for concurrent challenges. It protects medical personnel from viruses and bacteria, makes comfortable medical garments, and ensures that it does not contribute to the waste problem inherent to the fashion industry or the microplastics problem inherent to most synthetic fibers.
<b>FreshSpoke</b>	Marcia Woods	FreshSpoke is a consumer technology company pioneering a reimagination of wholesale logistics in the grocery space. Their innovative Distribution as a Service (DaaS) model allows retailers to order, pay for and receive products from emerging food and beverage brands in one automated transaction, solving multiple problems in the supply chain at the same time.
<b>Grengine</b>	Connie Stacey	Grengine (formerly Growing Greener Innovations) is a clean technology organization with a patented battery energy storage system (BESS) tackling two challenges at once: clean energy and access to energy for the 2.4 billion people who must burn something for light or heat. Grengine is a plug-and-play, modular battery power system for any type of battery chemistry, with any type of green energy input (solar, wind, hand crank) for a wide variety of applications from small generators to single megawatt small-scale utilities in any environment.

Name of Organization	CEO	Description
<b>Hydra</b>	Jessica Verhagen	Hydra Energy allows any Class 8 truck newer than 2012 to run on a blend of hydrogen and diesel fuels, reducing CO2 emissions by 40% with no increase in other pollutants. Because Hydra's conversion technology works on all makes and models, any truck owner can get the emissions performance they want without having to purchase new assets.
<b>Hyon Software</b>	Kristy Ehman	Hyon Software is a platform that helps organizations manage their physical assets. Large organizations often cannot keep track of their physical assets, which range from small equipment to furniture. Because of the lack of information, they end up disposing of assets only to buy the same items. Hyon helps organizations by finding cost savings for physical assets, extending their useful life and avoiding the purchase of new assets, bringing an internal circular practice to the organization.
<b>Impact Zero</b>	Erin Andrews	Impact Zero is a non-profit organization founded in 2020 to support people who have ideas on how to tackle climate issues. Impact Zero helps potential entrepreneurs to evaluate the potential of their ideas for creating change and producing cost-saving infrastructure to build up Canada's environmentally sustainable entrepreneurship ecosystem.
<b>Jack59</b>	Vanessa Marshall	Vanessa Marshall founded Jack59 in 2019 as a clean beauty company saving the planet one shampoo bar at a time. It makes bars of shampoo and conditioner that save up to three plastic bottles per bar. The biodegradable bars are formulated using ethically sourced, natural, non-toxic ingredients for a variety of hair types and conditions.
<b>Korotu</b>	Agata Rudd	Korotu provides a software as a service (SaaS) platform that leverages remote-sensing data from a variety of sources, from satellites to monitoring by citizen scientists, and uses their artificial intelligence (AI) technology to interpret the data. The AI tracks changes in the natural environment and measures ecological services provided by forests, wetlands and agricultural land like carbon storage in conservation areas.
<b>Made with Local</b>	Sheena Russell	Made with Local is a better-for-you snack brand doing business better for people and the planet. It started with sourcing local goods from real farmers and its products are made with care by workers upskilling in its community kitchen. Made with Local still sources farm-direct, building relationships with growers and plays an increasingly important part in the sustainable Canadian agricultural economy.
<b>Maven Water &amp; Environment</b>	Monique Simair	Maven Water & Environment is a cleantech and consulting company focusing on the water sector for industrial customers, predominantly the mining sector. Its water treatment technologies are environmentally friendly, using less power, less water and fewer chemicals with a smaller GHG footprint than conventional methods.

Name of Organization	CEO	Description
<b>Ocean Legacy</b>	Chloe Dubois	Ocean Legacy is a B.C.-based, vertically integrated organization tackling the plastic pollution problem and marketing 100% recycled content marine plastic pellets for a circular plastics economy. It focuses on four “EPIC” pillars: Education & Research, Policy & Advocacy, Infrastructure Development, and Cleanup & Restoration to better manage our plastic resources to end plastic pollution.
<b>Ondine OceanFarm</b>	Bretton Hills	Ondine OceanFarm produces oysters, scallops and kelp, which are a nutritious, affordable, sustainable, locally grown food. This nutrient-dense and natural crop requires no fertilizer, pesticides, herbicides, feed or freshwater. Ondine OceanFarm’s shellfish aquaculture is regenerative and is a form of natural bioremediation, rebuilding sustainable coastal habitats that have been impacted by industrial development and commercial shipping.
<b>RainStick</b>	Alisha McFetridge	RainStick is a clean technology company with a revolutionary way to save water and conserve energy. The RainStick Wi-Fi-enabled shower conserves 80% of water usage and up to 80% of energy while delivering double the water pressure for a better experience and more effective water usage.
<b>Re4m Design and Fabrication Inc.</b>	Heather Jeffery	Re4m Design & Fabrication is an eco-manufacturer that specializes in designing and fabricating sustainably made furnishings, fixtures and displays using rescued and reclaimed materials. Re4m Design & Fabrication intercepts construction, industrial and commercial waste before it happens, reinventing these materials into custom furniture, fixtures, signs and displays.
<b>Remix Snacks</b>	Isabelle Lam	Remix Snacks is an innovation company focused on the better-for-you snack category. They make bean-based snacks made with upcycled, dehydrated fruits and vegetables for great taste with more fiber, iron and vegan protein. The founders are dietitians tackling two problems: the lack of nutritious, on-the-go food choices and food waste from imperfect produce, which often ends up in the landfill despite having the same nutrient profile as its prettier siblings.
<b>Rewatt Power</b>	Prageet Nibber	Rewatt Power is a climate accounting software solution to help companies quantify and measure their GHG impact, helping to monetize carbon credits from net-zero projects. Rewatt supports renewable electrification projects, from residential to utility scale for a wide variety of customers and sectors.

Name of Organization	CEO	Description
<b>Rewilding Water &amp; Earth</b>	Robin Annschild	A construction, design and project management organization, Rewilding Water & Earth works with governments, municipalities, private clients, schools and NGOs to restore wetlands and watersheds. Rewilding Water & Earth provides wetland, stream and watershed restoration project planning, design and construction to First Nations, municipalities, regional districts and conservation organizations.
<b>Road Coffee</b>	Alisha Esmail	Road Coffee was founded in 2016 as a coffee importer, roaster and retailer with a deep commitment to sustainability. Road Coffee sources coffee directly from the grower to eliminate as many steps in the supply chain as possible and introduce more economic, social and environmental sustainability to the farmer.
<b>Satya Organic</b>	Patrice Mousseau	Satya Organic was founded in 2014 to deliver clean, effective and steroid-free skin relief for all skin types. The product is designed to soothe itch and irritation from skin conditions like eczema and psoriasis with an all-natural formulation.
<b>Shoo-Foo Eco Linens</b>	Dany Filion	Shoo-Foo Eco Linens manufactures eco-sustainable home goods and linens by sourcing their materials from organically grown bamboo, which are toxicant-free. The Forest Stewardship Council (FSC)-certified fabrics are a better choice for the home and a better choice for the environment.
<b>Skipper Otto</b>	Sonia Strobel	Skipper Otto is a direct-to-consumer Canadian seafood distribution company, revolutionary for their business model and transparency. They connect consumers to B.C. fishing families, cutting out several middlemen and thousands of miles of logistics that, in the traditional seafood system, can reduce food safety, traceability and increase the GHG footprint.
<b>Skwálwen Botanicals</b>	Leigh Joseph	Skwálwen Botanicals is an Indigenous-owned luxury skincare brand that uses healing natural botanicals carefully harvested according to cultural mandates of respect and reciprocity. The botanical formulations come from a long tradition of plant medicine in Indigenous culture to be shared with consumers around the world wanting clean, nourishing products.
<b>Stormflow Surfacing</b>	Julie Redfern	Stormflow Surfacing manufactures an innovative, eco-friendly permeable pavement product for residential, commercial, institutional and municipal use. Stormflow's research-backed technology helps water return to the ground, instead of being an impermeable surface that diverts rain and storm waters to gutters and aging sewers.

Name of Organization	CEO	Description
<b>Technologies Ecofixe</b>	Marisol Labrecque	Technologies Ecofixe develops biological wastewater treatment solutions for municipalities and industrial customers. Technologies Ecofixe was founded to develop better technologies to treat wastewater and to improve the quality of the water returning to our waterways to protect them and the fauna and flora that live in them.
<b>The Tare Shop</b>	Kate Pepler	The Tare Shop is built for sustainability and the smallest environmental impact possible. From the first day the Tare Shop opened, the company has tracked its waste, recycling, compost and garbage. They publish their environmental and social impact in an annual report to measure their success, look for opportunities for improvement and provide transparency to consumers, helping them understand the difference their buying decisions make.
<b>Think Dirty</b>	Lily Tse	Think Dirty is an app that provides transparency to consumers about the ingredients in their personal care and home products. It features brands without toxic and carcinogenic chemicals. Think Dirty is fully independent and ranks only the product ingredients, unlike other ingredient databases that consider a brand's social and environmental track record.
<b>Viridis Research</b>	Macarena Cataldo-Hernandez	Viridis Research solves water treatment problems to remove microplastics, solvents and chemicals. They have an eco-friendly technology that quantifies the amounts of toxicants captured and destroyed, and the amount of carbon dioxide (CO2) reduced by different parts of the process. Viridis Research is designed for industrial and home consumers to have safe, pure water from a sustainable system with low operating and maintenance costs.
<b>VL Energy</b>	Ling Bai	VL Energy is a consulting company helping companies measure and report on their emissions. More recently, they are also a cleantech company commercializing predictive emission measuring and monitoring software using AI. It is a tool for benchmarking commercial and industrial emissions that allows for scenario-based analysis so companies can plan effective mitigation strategies. The platform also handles carbon credit registration for companies to monetize.



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- 74 Identity category descriptions were shortened to fit category titles on the horizontal axis. Full identity category descriptions are: racialized people (includes people identifying as Black as well as other people of colour); Indigenous Peoples (includes First Nation, Inuit and Métis); persons with disabilities (includes physical, mental, cognitive and other disabilities that may be permanent or temporary in nature); 2SLGBTQ+ community (includes people identifying as lesbian, gay, bisexual or pansexual, transgender, queer, two-spirit, etc.); and Prefer to specify type(s) of diversity not represented in this list (please specify).

