



Building Resiliency and Sustainability for the Bio-economy to Withstand Disruption

Evaluation Report

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for

BioTalent Canada

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Introduction

Purpose of Report

BioTalent Canada undertook the *Building Resiliency and Sustainability for the Bio-economy to Withstand Disruption* project from Spring 2021 to Fall 2023. This report provides the main findings from the project evaluation that was conducted throughout project design and implementation. The report is structured according to the main overall questions and themes as outlined by the Future Skills Centre in their evaluation guidance document.¹

Project Overview

The *Building Resiliency and Sustainability for the Bio-economy to Withstand Disruption* project consisted of two main phases, with multiple components in each phase.

Phase One – Research

The initial phase involved undertaking a research program focused on identifying and understanding factors that contributed to resiliency and sustainability among organizations in the Canadian bio-economy. Using the COVID-pandemic as a focal point, BioTalent Canada undertook primary and secondary research with partners in the bio-economy to determine what contributed to organizations' capacity to withstand major disruptions caused by the pandemic for the industry. The main research components included:

- Literature review and environmental scans
- Survey of employers in the Canadian bio-economy (n=344 employers)
- Semi-structured qualitative interviews with sector representatives (n=33)
- Thematic case studies focusing on innovative, successful approaches to addressing disruption (4 case studies)
- Focus groups with employers (n= 18 participants)

Phase Two – Tool and Resource Development

Findings from the research phase were then integrated into the industry tool and resource development phase of the project. These included:

- I.D.E.A.L Bioscience Employer™ Recognition program – this program recognizes organizations in Canada's bio-economy leading the way in embodying the diverse and inclusive corporate principles needed to promote growth and success in the sector.
- Building Workplace Resiliency Resources – a series of resource available on-line that were designed to help employers with onboarding, retention, and recruitment with an end goal of developing resiliency within an organization and

¹ Future Skills Centre (no date). *Guidance and Questions for Evaluators of FSC-Supported Projects*.

promoting a strong talent pipeline through principles of inclusion, diversity, equity, and accessibility leadership (IDEAL).

- Adopting Inclusion, Diversity, Equity, and Accessibility
 - Hiring Internationally Educated Professionals (IEPs)
 - Understanding Canadian Human Rights
 - Developing Organizational Culture
 - Encouraging Employee Engagement
 - Fostering Strong Leadership
 - Leveraging Performance Management
 - A Checklist for Bio-economy Employers
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- Specifications for a pilot Certification program for the bio-economy sector.
 - Biomanufacturing
 - Clinical Trials

1) Stakeholders and Evaluation Goals

1a) Who were the stakeholders for the project?

The main stakeholders for the project were employers and organizations in the Canadian bio-economy. From LMI research, BioTalent Canada has identified that the majority of bio-economy companies are small or medium-sized with fewer than 50 employees. These employers cover four sub-sectors (bio-health, bio-energy, bio-industrial, and agri-bio), and are supported by various regional industry associations, business incubators/accelerators and training organizations. The tools and resources developed during Phase 2 of the project were targeted directly to these small or medium-sized employers in the Canadian bio-economy.

1b) How has the purpose and use of this evaluation been articulated?

BioTalent Canada is known in the industry among stakeholders as an organization that uses an evidence-based approach to its program design, development and implementation. As a result, stakeholders participating in the research components or accessing the tools/resources were made aware that these were components of a larger research project being undertaken with the support of the Future Skills Centre to better understand how resiliency and sustainability could be developed within the Canadian bio-economy. The evaluation was communicated to participants as one component that would assist with this overall learning.

2) Learning-focused Background and Project Description

The Project was designed to address four main objectives:

1. Research, identify and evaluate key issues, models, best practices, and lessons learned regarding the concept of resilience in the face of major disruptive events.
2. Develop evidenced-based resiliency tools and resources for Canadian bio-economy organizations.
3. Develop evidence-based tools and resources that support diversity and inclusion during times of disruption.
4. Knowledge sharing and dissemination of tools and resources to Canadian bio-economy companies and other sectors.

Throughout the project, the objectives remained relevant which some additional components being added to specifically address Objectives 2 and 3. The activities under Objective 4 continue to be underway with continued sharing and dissemination of tools and resources developed through this project.

2a) Project Need and Opportunity

Why was the project needed?

The Canadian bio-economy was impacted by the COVID pandemic in a multitude of ways with some resulting in increased opportunities (e.g., investments, innovation, discoveries) and others resulting in large challenges (e.g., workplace restrictions, ongoing talent shortages). How the bio-economy responded to the disruptions had not been fully analysed prior to this project. Using a resilience and sustainability perspective, this project was able to capture and integrate the identified learning from both the positive and negative aspects of the disruption caused by the pandemic into a series of tools and resources that have been designed to benefit industry as it faces considerable challenges in attracting and retaining sufficient talent over the upcoming decade.

BioTalent Canada's ongoing labour market intelligence (LMI) research has demonstrated a strong need for tools and resources that can assist employers in building modern workplaces that are diverse, equitable, inclusive, and accessible – a key contributing factor to organizational resilience as identified in the Phase 1 research for this project. While larger companies often have internal resources to assist with these goals, as highlighted in recent LMI, the majority of bio-economy companies are small or medium-sized businesses: 83% report fewer than 50 employees, and 55% generate annual total gross revenues of less than \$1 million – figures that have held steady since BioTalent Canada's first LMI study in 2008. Just 30% have a dedicated HR department.

Who are the populations that this project aimed to serve?

The project was designed to focus on small- and medium-sized employers in the Canadian bio-economy who were identified via recent LMI research as in need of relevant tools and resources to assist with the ongoing challenges encountered with recruitment, onboarding and retention, often without the benefit of having a dedicated HR function in their small organizations.

To what extent were these needs being addressed before project implementation? What was known about what needed to be improved and/or expanded?

LMI research conducted by BioTalent Canada highlighted that recruiting, onboarding and retaining talent to fill increasingly numerous vacancies current and projected over the upcoming decade is a key challenge for the industry, particularly among small- and medium-sized bio-economy employers. With limited HR capacity, employers have indicated that during and post-pandemic, this challenge has increased as they attempt to make workplace adjustments and feel impacts from the changes to the talent supply brought about by the pandemic, particularly in the life sciences and increased demands across sectors in areas such as manufacturing. The current Project was designed to build on the LMI research and gather specific data and information on key factors contributing (or detracting) from resiliency and sustainability in the bio-economy, and then develop tools/resources using this information to address the needs expressed by employers as identified in Phase 1 of the research.

2b) Logic Model

Figure 1 presents the logic model developed for the project outlining the key activities, outputs and anticipated outcomes (short-, medium- and long-term). The project focus was on research leading into the development of tools and resources that would contribute ultimately to a longer-term outcome of organizations in the Canadian bio-economy are resilient and sustainable in highly disruptive situations.

The numerous activities undertaken during the project were categorized into the following groupings:

- Research planning
- Scoping consultations
- Engagement planning
- Conducting research
- Tools and resources planning
- Development of tools and resources
- Communications planning
- Knowledge sharing and dissemination

The BioTalent Canada team worked with a team of consultants and subject matter experts to design and implement the multiple components under each of these activity groupings.

What assumptions were initially made about the project in order to achieve its objectives?

The main assumption was that the project purpose and objectives would be relevant for the industry to have employers engage in the various components including research (surveys, interviews, case studies), tool/resource design (roundtables), and tool/resource implementation. Without the engagement and participation with industry, this project would not have been able to proceed beyond Phase 1. Fortunately, there has been significant levels of industry and partner participation in all components of the project which has permitted the iterative, developmental approach to be fully realized.

How was success initially articulated for this project?

Success was initially defined as identifying learnings and potential areas of improvement regarding both the process of undertaking research and for tool/resource development for the bio-economy. In addition, there has been focus on success in achieving the anticipated outcomes; however, given the timing of the project, these are primarily at the short-term outcome level at this stage of development.

Figure 1: Logic Model for Building Resiliency and Sustainability for the Bio-economy to Withstand Disruption Project

Activities	Outputs	Short term outcomes	Medium term outcomes	Long term outcomes
Research planning	Draft and final research plans	Models, DEI considerations, best practices, and lessons learned regarding the concept of resilience in the face of major disruptive events are researched, identified, and evaluated.	Bio-economy organizations across Canadian provinces engage in skills development to minimize disruption	Organizations in the Canadian bio-economy are resilient and sustainable in highly disruptive situations
Scoping consultations	Identified stakeholders, consultations			
Engagement planning	Identified interviewees, logistic plan, outreach			
Conducting research	Environmental scan, industry survey, research findings report, case studies, identified/inventoried DEI considerations			
Tools and resources planning	Draft and final tools and resources plan	Evidenced-based resiliency tools and resources that also account for DEI considerations are developed for Canadian bio-economy organizations	Bio-economy organizations across Canadian provinces engage in strategic organizational planning to minimize disruption.	
Development of tools and resources	Resiliency checklist, Tools/resources for building resilience, recognition program for inclusion, diversity, equity and accessibility, certification program design			
Communications planning	Draft and final communications plan	Knowledge is shared and tools and resources are disseminated to Canadian bio-economy companies and other sectors.		
Knowledge sharing and dissemination	Outreach to industry partners, organizations and other sectors, disseminated tools and resources			

3) Evaluation Questions, Data Sources and Indicators

The startup phase of the project included developing an evidence generation workplan that outlined a series of evaluation questions, indicators, methods and data sources. The workplan was used to guide the evaluation work across the project and was updated and refreshed throughout the project as components were added or adjusted. Given that BioTalent Canada was not “testing” a model or implementing individual-based training programs for this project, the focus was primarily on implementation (process) and effectiveness (outcomes) of a tool/resource development approach. As a result, there was limited focus or data collected on issues of efficiency or causal attribution as would generally be included in projects with specific interventions that were being tested.

Figure 2: Evaluation Questions, Indicators, Methods and Data Sources for the Evaluation of the *Building Resiliency and Sustainability for the Bio-economy to Withstand Disruption Project*

Evaluation Question	Indicator	Methods	Data Sources
Implementation (Process)			
1. To what extent were the activities undertaken as planned?	Alignment between plans and progress reports	Interviews Document review	BioTalent Canada team members Progress reports Planning documents
2. To what extent were the research findings integrated into the tools and resources?	Alignment between research findings and tool/resources	Interviews Document review	BioTalent Canada team members Research reports Tools/resources
3. What are the main process learnings from implementing the project?	Identified process learnings	Interviews Document review	BioTalent Canada team members Progress reports
Effectiveness (Outcomes)			

Evaluation Question	Indicator	Methods	Data Sources
4. To what extent have the short-term outcomes been achieved?			
a) Models, DEI considerations, best practices, and lessons learned regarding the concept of resilience in the face of major disruptive events are researched, identified, and evaluated.	Evidence of a research plan Evidence of an engagement plan # of key stakeholders/industry partners consulted # of interviews completed # of surveys completed # of reports completed # of case studies completed	Interviews Document review	BioTalent Canada team members Progress reports
b) Evidenced-based resiliency tools and resources that also account for DEI considerations are developed for Canadian bio-economy organizations	Evidence of tool and resource plan # of tools/resources completed Inventory of DEI considerations, by target population # of tools/resources that incorporate actionable DEI considerations	Interviews Document review	BioTalent Canada team members Progress reports
c) Knowledge is shared and tools and resources are disseminated to Canadian bio-economy companies and other sectors.	Evidence of knowledge dissemination plan # and types of promotional activities and dissemination channels # of bio-economy employers reached # of other bio-economy organizations reached	Interviews Document review	BioTalent Canada team members Participants/partners Progress reports

4) Evaluation Results

The evaluation results are presented below according to the selected evaluation questions. Overall, the evaluation found that the project achieved its original four objectives and has provided a base from which BioTalent Canada is continuing to further develop tools and resources for industry. For example, the I.D.E.A.L Bioscience Employer™ Recognition program that was developed under the scope of this project is continuing to be implemented and potentially expanded in its second year. Similarly, the certification scoping work has resulted in the development of an MOU with a partner to further explore and develop a certification program for specific competencies within the bio-manufacturing sector.

4a) Findings on Implementation (Process)

To what extent were the activities undertaken as planned?

The findings from interviews and the review of plans and progress reports demonstrate that the activities were largely undertaken in accordance with what was planned with some changes in timelines and some additional components added to the project to address and strengthen certain areas such as certification frameworks and diversity, inclusion, equity and accessibility programming. These additions were identified from both the literature review and through consultations with industry as to areas that would enhance organizational resiliency and improve recruitment, onboarding, and retention of key talent for the industry.

To what extent were the research findings integrated into the tools and resources?

The review of tools and resources found high levels of integration of research findings from not only Phase 1 of the research, but also recent LMI research results. The close alignment of tools/resources with research findings and the direct integration of results into products demonstrates BioTalent Canada's continued evidence-based approach when designing and implementing initiatives. According to interviews and observations, one major contributor to this close alignment was BioTalent Canada's approach to the development process. The development team consisted of industry representatives, researchers who had conducted Phase 1 and were highly familiar with the key findings, subject matter experts, tool designers, and members from the marketing/communications team. This multi-faceted team was able to draw on various expertise, information and perspectives to develop tools and resources that were not only appealing and engaging, but also accurate in content and grounded in BioTalent Canada's own research findings according to industry surveys, interviews, roundtables and case studies.

What are the main process learnings from implementing the project?

The main process learnings were documented in the quarterly progress reports for the project. These included:

- ***Need to validate secondary research findings with primary research*** - While there is a substantial literature available on organizational resiliency and sustainability, the project team learned that there was a need to reflect on the findings with industry representatives and advisors to determine which aspects were most applicable to the bio-economy. The findings from the primary research (industry interviews, surveys) assisted in identifying the most significant factors or contributors to organizational resiliency for Canadian bio-economy companies. Given the diversity of the bio-economy (regional, size, sub-sector) combined with the range of disruption impacts experienced to date from the pandemic, the primary research demonstrated an array of significant contributing factors for resiliency among participants.
- ***Gained experience with the Ethics Review process*** - The BioTalent Canada project team had to move quite quickly in developing an ethics review submission to the IRB for this project. This process was new for the team but building on some previous experience with these processes from the research team, BioTalent Canada was able to develop a submission that was reviewed as complete and sufficient to provide IRB members with the needed information to grant the project an exemption. The actual process of going through the steps was a learning opportunity for many of the team members and encouraged BioTalent Canada to develop greater capacity in this area through additional training on the Tri-Council Guidelines and ethics review process. The timing implications of this stage also provided learnings for the team. Given that the design work has to be significantly advanced prior to developing the ethics submission, this requires planning and effort prior to the contacting of potential participants (which in itself can take up to two months to arrange industry focus groups).
- ***Quality tool/resource development requires diverse expertise*** - BioTalent Canada identified the need for a relatively large, diverse team with different areas of knowledge, experience, and expertise to effectively “translate” the research and evidence from Phase I of the project into relevant, engaging tools and resources for the industry. Initially the Project had been conceptualized as a “hand-off” of the research findings to a small team of tool/resource developers; however, as BioTalent Canada began to scope and plan the development phase, it became apparent that given the complexity and multi-factorial nature of organizational resilience combined with the diversity of the bio-economy, a more robust approach would be needed to meet the resource development goals of the project. This led to the assembly of a larger, more diverse development team according to areas of expertise such as HR tool development, National Occupational Standards for competencies and skills for the bio-economy, skills training, research “translation”, diversity/inclusion, HR functions within SMEs, and marketing and communications.

- **Developing shared goals/objectives with partners** – Part of the project involved undertaking the process for negotiating and developing 3-way agreements that take into consideration not only the individual needs of each partner, but also a shared goal/objective for the overall industrial sector. While BioTalent Canada has considerable experience working in partnerships and developing agreements and MOUs, this particular process has required multiple discussions, and has had to ensure that reasonable alignment will occur between various components such as competency definition, national occupational standards, training content, employer needs, and certification approach. The benefits from this additional work on alignment is that the decisions and areas requiring further clarification have occurred relatively early in the pilot process because of development of MOUs between partners. This process hopefully results in more focused pilot activities that will in turn result in higher quality evidence and learnings for future decision-making and potential scaling-up.

4b) Findings on Effectiveness (Outcomes)

The evaluation was able to collect some information on early outcomes for the project with anticipation that BioTalent Canada will continue to monitor identified outcomes in its ongoing consultations with industry, particularly with respect to continued development of the certification framework, ongoing implementation of the I.D.E.A.L. Bioscience™ recognition program, and how the tools/resources are being used by stakeholders post-dissemination.

Short-term Outcome #1: Models, DEI considerations, best practices, and lessons learned regarding the concept of resilience in the face of major disruptive events are researched, identified, and evaluated.

The Phase 1 research components was carried out as planned with larger numbers of anticipated respondents for the industry survey (over 300) and good representation across all sub-sectors in the semi-structured interviews. The research activities resulted in various research reports that outlined the main findings regarding models, DEI considerations, best practices and lessons learned regarding organizational resilience in the bio-economy. The validation of secondary research largely conducted with sources external to the bio-economy with the findings from the primary research with bio-economy employers was an important contributing factor to ensure relevance and accuracy of the findings. According to the initial indicators identified for this outcome, the findings were:

- Three versions of a research plan; updated as new components were added.
- An engagement plan for recruiting industry partners to participate in the research including for surveys, interviews and focus groups/roundtables.
- 42 key stakeholders/industry partners consulted
- 33 semi-structured qualitative interviews completed with bio-economy employers.
- 337 surveys completed with bio-economy employers.

- 6 research reports completed including presentation deck, survey reports, summary reports.
- 4 thematic case studies completed in the areas of DEI considerations, mental health supports, role of skills in building resiliency, and SMEs.

Short-term Outcome #2: Evidence-based resiliency tools and resources that also account for DEI considerations are developed for Canadian bio-economy organizations.

Core components of the project were focused on developing evidence-based tools and resources to assist bio-economy employers in building organizational resiliency. The evaluation found considerable evidence supporting the achievement of this outcome with multiple examples of tools/resources that were directly attributable to the activities undertaken by the project team. The examples of tools/resources included:

- I.D.E.A.L. Bioscience Employer™ Recognition program – this program recognizes organizations in Canada’s bio-economy leading the way in embodying the diverse, inclusive, equitable and accessible corporate principles needed to promote growth and success in the sector.
- Building Workplace Resiliency Resources – a series of resource available online that were designed to help employers with onboarding, retention, and recruitment with an end goal of developing resiliency within an organization and promoting a strong talent pipeline through principles of inclusion, diversity, equity, and accessibility leadership (I.D.E.A.L.).
 - Adopting Inclusion, Diversity, Equity, and Accessibility
 - Hiring Internationally Educated Professionals (IEPs)
 - Understanding Canadian Human Rights
 - Developing Organizational Culture
 - Encouraging Employee Engagement
 - Fostering Strong Leadership
 - Leveraging Performance Management
 - A Checklist for Bio-economy Employers
- Specifications for a pilot Certification program for the bio-manufacturing sector.

According to the initial indicators identified for this outcome, the findings were:

- Multiple versions of a tool/resource development plan that was updated as new components were added and tools/resources began to evolve.
- 10 different tools, resources and programs were developed based on research findings.
- One inventory of DEI considerations, by target population that was integrated into the resource entitled “Adopting Inclusion, Diversity, Equity, and Accessibility” and then referred to throughout all other tools.
- 9 tools and resources that incorporate actionable DEI considerations.

Short-term Outcome #3: Knowledge is shared and tools and resources are disseminated to Canadian bio-economy companies and other sectors.

BioTalent Canada has a very active industry engagement team along with extensive national and regional networks of partners and industry stakeholders. Augmented with an effective internal marketing and communications team, this capacity to share and disseminate tools/resources with industry has benefitted the project and contributed significantly to achieving this outcome. Tools and resources from the project were highlighted, shared and disseminated through these connections and efforts. Reviewing progress reports, the main dissemination channels used by BioTalent Canada for this project included:

- *Attendance to conferences and other speaking, networking, and virtual events*
- Project and project products webpages
- Project and project products' press releases.
- Corporate partnership network of over 75 partners
- LinkedIn promotion - Over 20,000 followers
- X (Formerly Twitter) promotion - Over 3,200 followers
- Facebook promotion - Over 1,082 followers
- Newsletter subscribers' promotion: Over 17,000

The original evaluation plan included dissemination-based indicators such as the number of bio-economy employers reached, and other bio-economy organizations reached such as associations, and training organizations. While specific numbers were not possible to collect for the dissemination activities during the period covered by the evaluation, estimates from the marketing and communications group are that the dissemination channels noted above generally reach approximately 17,000 bio-economy stakeholders in total per year, 8,000 of whom are employers.

5) Discussion and Implications

FSC has identified areas or dimensions that could potentially be explored via larger lessons learned on broader implications. A brief discussion of those relevant for this project are presented in the section below.

5a) Expansion

Is there a need to expand the program or project to reach new population groups or different geographies?

The evaluation found that employers participating in the I.D.E.A.L Bioscience Employer™ Recognition program identified many positive benefits from participating, and they supported further work and support in this area from BioTalent Canada. Using a recognition approach to highlight leadership efforts and success with inclusion, diversity, equity and accessibility was assessed by participants as appropriate for the industry and likely to encourage and engage other employers in taking steps towards making positive changes. This program was started under the scope of the current project, but likely has potential to expand to include more employers with perhaps different levels and areas of recognition.

Another component of the project that was added in part-way through and is continuing development is developing certification that aligns with industry-validated National Occupational Standards for specific competencies. The initial focus is on a select set of competencies required in the bio-manufacturing, an area that gained rapid prominence and growth during the pandemic and continues to be a challenging area for recruitment, onboarding and retention in the industry. Considerably more work is likely needed in the area of certification in not only bio-manufacturing but likely also other sub-sectors of the bio-economy to sufficiently address the needs that employers are identifying that align with building organizational resilience.

5b) Adoption

Are there opportunities for other organizations serving the populations in question to adopt elements of what was being explored here?

As was highlighted during the assessment of need for tools/resources, there are significant gaps in HR capacity in the industry, along with ongoing need for assistance with training, onboarding and professional development. As found in the research conducted for this project, many of these were identified as contributing factors to building resilience. The approach used by BioTalent Canada characterized by using evidence to inform tool/resource development, connecting factors to building organizational resiliency, and actively integrating inclusion, diversity, equity and accessibility considerations as essential components could be adopted by other organizations linked to the bio-economy by providing services, supports and programming.

5c) Investment or Partnership (actual or potential)

Did the project in question attract additional investment or partnership support over the course of the FSC engagement?

The current negotiations underway in developing MOUs to design and deliver a small pilot certification program for the bio-manufacturing industry is an example of how the project has contributed to attracting additional investment and partnership support. Most importantly, these MOUs will be focused not only on the benefits of individual organizations involved, but also on shared objectives and goals at an industry level.

BioTalent Canada signed the MOU with STEMCELL Technologies and Canadian Alliance for Skills and Training in Life Sciences (CASTL). STEMCELL Technologies, as Canada's largest biotechnology company with over 1,500 employees, is making a significant commitment through the Memorandum of Understanding (MOU) with BioTalent Canada. Their collaboration aims to address a critical need: securing a robust talent pipeline for the biomanufacturing sector. By fostering skilled professionals and supporting BioTalent Canada's mandate, STEMCELL Technologies will play a vital role in advancing the growth and sustainability of this industry.