Innovation, Science and Economic Development Canada (ISED)

Innovation Superclusters Initiative: Economic Analysis

Final Report

March 2022

Disclaimer

Ernst & Young LLP ("EY") was engaged by Innovation, Science and Economic Development Canada ("ISED") to conduct business and specialized economic analysis for project-specific outputs and outcomes related to activities undertaken by participants in projects receiving Innovation Superclusters Initiative ("ISI") funding.

In preparing this document ("Report"), EY relied upon unaudited data and information from third party sources, surveys of Supercluster project partners, and discussions and consultations with stakeholders in industry, associations and academic and research institutions (collectively, the "Supporting Information"). EY reserves the right to revise any analyses, observations or comments referred to in this Report if additional Supporting Information becomes available to us subsequent to the release of this Report. EY has assumed the Supporting Information to be accurate, complete and appropriate for the purposes of the Report. EY did not audit or independently verify the accuracy or completeness of the Supporting Information. Accordingly, EY expresses no opinion or other forms of assurance in respect to the Supporting Information and does not accept any responsibility for errors or omissions, or any loss or damage as a result of any persons relying on this Report for any purpose other than that for which it has been prepared.

Context Concerning Study Limitations

This Report represents Phase One of a three-year study:
The economic impact analysis presented in this study represents the early findings from a three-year study of the Superclusters program. This study covers Supercluster project-related activities only to **August 31, 2021**.

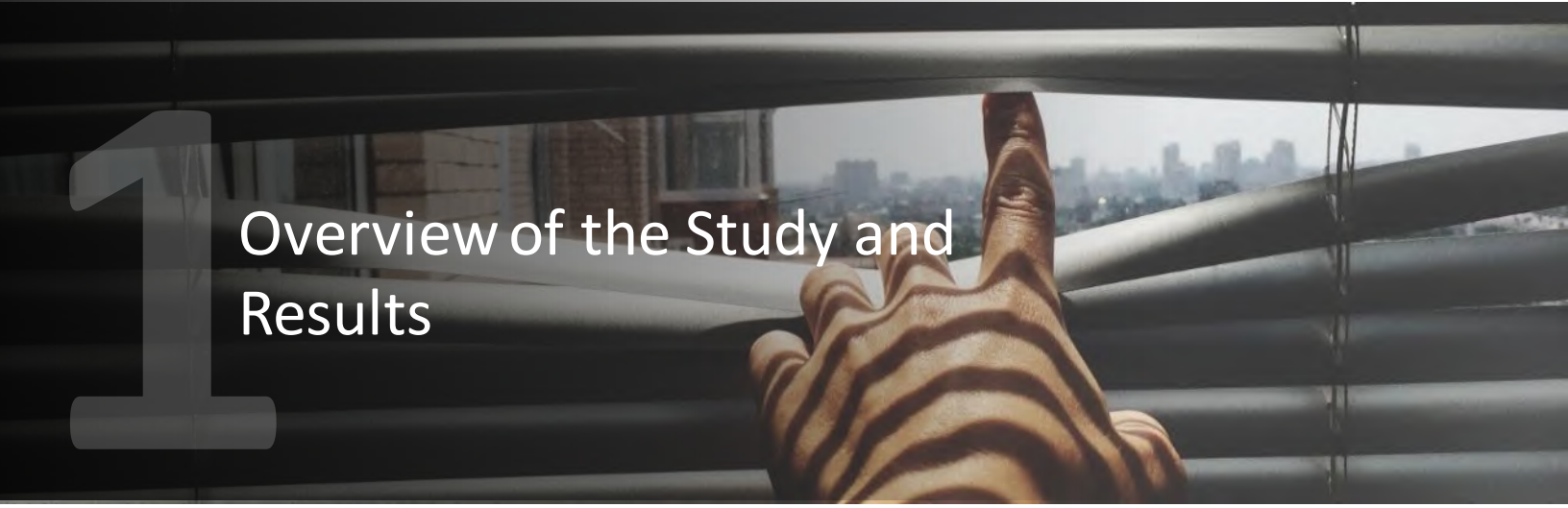
Additional Supercluster activity and impacts will be captured in future years' reports:
Since **August 31, 2021**, the Superclusters have continued to build their respective innovation ecosystems – between September 1, 2021 and January 31, 2022, the Superclusters have:

- Announced 36 additional projects,
- Partnered with 259 organizations through these projects, and
- Provided nearly $44 million in new project funding.

Additional projects, partners, funding, and support activities have been, or will be, announced. These projects and activities will likely have additional economic impacts that will be reflected in the future years' reports as additional information becomes available.

For information on the current activities under the Innovation Superclusters Initiative, please visit their website at: https://www.ic.gc.ca/eic/site/093.nsf/eng/home

Table of Contents



1 Overview of the Study and Results

Innovation, Science and Economic Development Canada ("ISED") pursues several initiatives across all facets of the Canadian economy to promote investment conditions, foster innovation, improve Canada's global trade competitive positioning, and ensure Canadian businesses compete in a fair and efficient marketplace. The Innovation Superclusters Initiative ("ISI") is one example of ISED's programs to strengthen Canada's rising industries.

Ernst & Young LLP ("EY") was engaged by ISED to conduct specialized economic analysis for project-specific outputs and outcomes related to activities undertaken by participants in projects receiving ISI's funding. As part of the analysis presented in the report, EY has completed the following tasks:

- Detailed the approach that was used to conduct the economic analysis, including an overview of the stakeholder engagement process and methodologies for the economic impact projections;
- Provided an overview of program-level and Supercluster-specific[1] insights gained through stakeholder outreach and the consolidation of project activity reports ("PARs"); and,
- Developed short-term (5-year) and long-term (10-year) projections of potential economic contributions in terms of employment at the national level resulting from project spending.

EY's economic analysis involved qualitative and quantitative assessments of Supercluster activities across five main pillars of socioeconomic benefits:

Economic Growth

Investments in growth opportunities for member organizations that generate positive economic outcomes

Productivity

Improvements in supply chain integration, production processes, access to inputs, ability to scale, and overall efficiency

Innovation

New forms of Intellectual Property ("IP"), accelerating innovation through collaboration, commercialization of new products, processes and services

New Business & Employment Opportunities

Potential for follow-on investment, opportunities to access new global markets, jobs created and maintained, training & upskilling opportunities

Social Capital

Development of networks, norms, and trust that facilitate coordination and cooperation among members for mutual benefit

Notes: 1 Canada's Superclusters include: Digital Technology ("Digital"), Protein Industries Canada ("PIC"), Next Generation Manufacturing Canada ("NGen"), Scale AI, and Canada's Ocean Supercluster ("OSC")

Background Information

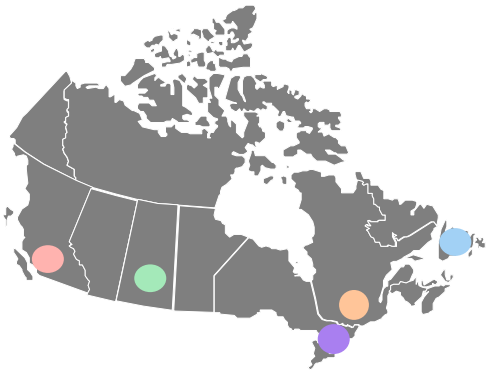
The Role of Superclusters in Canada's Economic Development

As part of the Innovation and Skills Plan in the 2017 Federal Budget, the Government of Canada implemented policies to build and maintain clusters with the goal of facilitating economic development, bolstering innovation activities, and enhancing the global competitiveness of key sectors. Clusters attract small and large companies and enable them to develop close connections with research centres, academic institutions (e.g., universities, colleges), non-profit organizations, and government agencies through collaboration.

Policies implemented by the Canadian government included a comprehensive search for the most competitive Superclusters. In 2018, five Superclusters were announced as part of the ISI. They are expected to accelerate growth in digital technology, plant proteins, advanced manufacturing, intelligent supply chains, and oceans, respectively. Collectively, the Superclusters' key goals include:

- Building connections and supporting growth;
- Linking small and medium-sized enterprises ("SMEs") to larger firms;
- Increasing investment in innovation; and,
- Maximizing IP creation.

Regional Distribution of the Superclusters



Digital Technology	PIC	NGen	Scale AI	OSC
Fast-tracking the advancement of Canadian digital technologies that improve our health and wellbeing, protect our environment, and drive economic productivity.	Increasing the value of Canadian crops and serving growing markets for plant-based meat alternatives and new food products.	Building up next-generation manufacturing capabilities, such as advanced robotics and 3D printing.	Bringing retail, manufacturing, transportation, infrastructure and information and communication technology sectors together to build intelligent supply chains.	Harnessing emerging technologies to digitize and optimize marine operations, maximize sustainable approaches to resources, and increase safety.

Purpose of Study

Given the significant investment of resources made into the ISI, ISED seeks to evaluate the program's socioeconomic impacts and use the insights gained to guide the growth of existing Superclusters, inform future policy development, and demonstrate the true value of the program for the Canadian economy.

The purpose of this study is to illustrate how the ISI is progressing towards achieving its long-term objectives. The results of this multi-year study could supply critical information for major stakeholders, including information on:

- Benefits for member organizations from joining the Supercluster and engaging in Supercluster-based activities;
- Potential need for resource allocation and implementation of policy interventions to address factors that may limit Supercluster effectiveness; and,
- Potential benefits for domestic and international firms in targeting Supercluster regions for relocation or future expansion.

Overview of Results

Key Stakeholder Outreach Insights

EY gathered required data and information through primary research, including interviews with representatives of key Supercluster stakeholder groups and web surveys of organizations that led, or otherwise participated in, Supercluster-funded projects. Key findings from the stakeholder outreach process were reviewed for each Supercluster and synthesized to identify common messages associated with the value of the ISI. Consistent themes relating to the ISI's benefits that emerged from stakeholder outreach include:

Collaboration

The ISI prioritizes forming partnerships to enhance projects' innovation potential and build long-lasting connections that strengthen ecosystems.

Commercialization

Organizations are encouraged to develop a business case and focus on the pathway to commercialization from the earliest project stages.

Risk Reduction

Through co-investment and the creation of consortiums, the ISI enables organizations to pursue projects that they may not pursue otherwise.

Economic Impact Projections

Project spending, as a result of both ISI funding and project partner matching, is expected to support Canada's economy across various socioeconomic aspects, including through creating or sustaining jobs across Canada. The figure below displays a summary of anticipated employment contributions to the Canadian economy at direct, indirect (through supplier linkages), and induced (through consumer spending) levels. Impacts in full-time equivalent ("FTE") jobs are displayed for the short-term (5-year) and long-term (10-year) projection periods, and for each Supercluster individually.

Total Economic Contributions of ISI Project Spending

Project Spending by Supercluster (FY 2018-19 to FY 2022-23)		Short-Term Projections (FY 2018-19 to FY 2022-23)	Long-Term Projections (FY 2018-19 to FY 2027-28)
Supercluster	Project Spending	FTE Jobs	FTE Jobs[1]
Digital	$302 M	4,175	6,061 – 11,336
PIC	$334 M	4,021	6,398 – 10,444
NGen	$429 M	7,024	11,585 – 21,074
Scale AI	$254 M	4,197	5,377 – 8,262
OSC	$290 M	4,460	5,619 – 7,642
Total	**$1.6 B**	**23,877**	**35,040 – 58,758**

Notes: 1 Long-term employment projection ranges derived from baseline and high-growth scenario estimates

2 Approach and Methodology

Economic Analysis Overview

EY's approach to assessing the economic impacts of the ISI includes three main stages: research and data collection, stakeholder outreach, and analysis of economic contributions. A summary of the approach for each stage can be seen below.

Research and Data Collection	Collection of data and information from secondary research to identify metrics for measuring socioeconomic benefits
Stakeholder Outreach	Primary research to gather informed insights on the ISI's impacts from a variety of stakeholders
Economic Contribution Analysis	Analysis of the ISI's expected impacts on employment at the national level over 5- and 10-year projection periods

EY began by conducting a thorough review of existing research on cluster impact assessment and investigating official government statistics to collect required data and identify data gaps. In addition, primary research was conducted in the form of interviews and web surveys. Key insights from primary and secondary research were used to assess short-term and long-term employment impacts.

Stakeholder Outreach Approach

To supplement the review and analysis of secondary data and information, EY sought to obtain stakeholder views on socioeconomic benefits generated by the ISI. To this end, in collaboration with ISED, key external stakeholder groups for outreach were identified, including:

- Project Partners
- Industry Associations
- Research Institutions
- Supercluster Representatives

Representative members of each group were selected to participate in structured interviews. EY also leveraged its internal network to conduct additional interviews with relevant sector experts. A total of 59 interviews were completed from July to September 2021. Concurrently, EY administered web surveys to collect detailed insights from organizations involved in Supercluster-funded projects. Survey questionnaires were prepared for each Supercluster aligning to the ISI's socioeconomic benefit pillars. A total of 176 survey responses were received from August to September 2021. Stakeholder outreach findings reflect the views of interviewees and survey respondents as a sample of their respective Supercluster stakeholder groups.

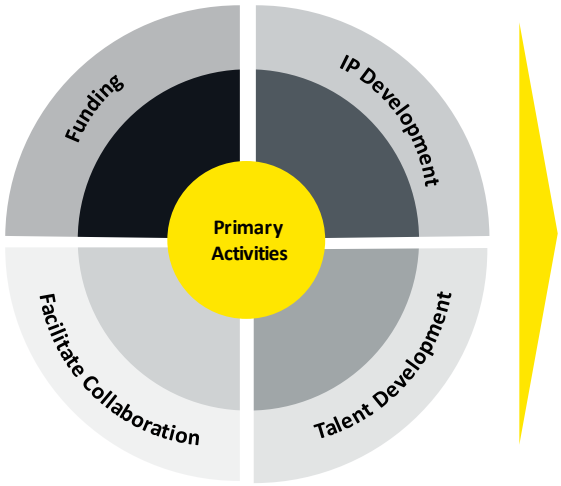
3 Innovation Superclusters Initiative Program Overview

Background

Announced in 2018 with an initial five year investment, the ISI brings together various industries in the form of five Superclusters designed to promote a positive feedback loop of business activity among industry players, academic institutions, and the public sector. The ISI is a pan-Canadian program; each Supercluster is centred in a different region of the country and works to build networks of key stakeholders. By matching government funding with industry contributions, the ISI aims to develop and strengthen ecosystems that will generate economic growth for Canada.

The Superclusters have made significant investments in a range of projects that are expected to generate positive impacts on the Canadian economy.

Primary Activities and Milestones of the Innovation Superclusters Initiative



$1.6B* Co-invested in projects by the ISI and industry partners

40%* Share of project funding provided by Superclusters program contributions

Milestones

863** New IP rights generated including patent applications, copyrights, and trade secrets

7,100 Number of members across Canada, alongside 1,780+ project partners

Sources: Innovation, Science and Economic Development Canada, EY Analysis

Notes: *based on Project Activity Reports (June 2019 – August 2021) **actual IP rights through September 2021

An overview of key insights regarding the ISI's benefits to organizations are provided in this section. Program-level insights are based on data and information collected across all Superclusters during the stakeholder outreach process. Insights are provided for each of the five pillars representing the ISI's range of socioeconomic contributions.

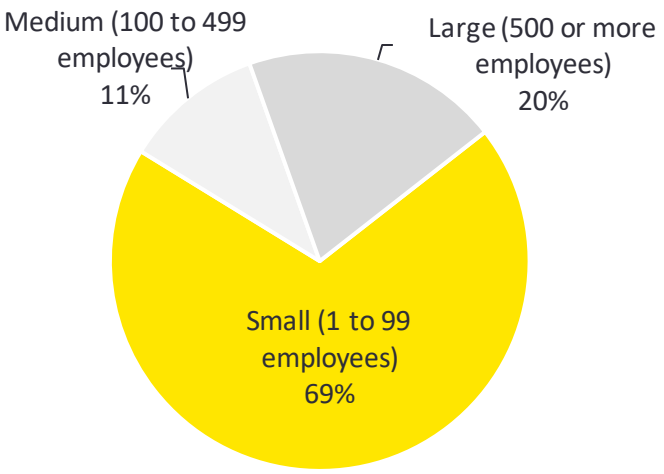
A program-level summary of the economic contribution analysis is also provided in this section. Estimated economic contributions to Canada's employment are detailed for short-term (5-year) and long-term (10-year) projection periods. The results reflect the expected impacts for each Supercluster from project spending.

ISI Program Overview

Summary Statistics

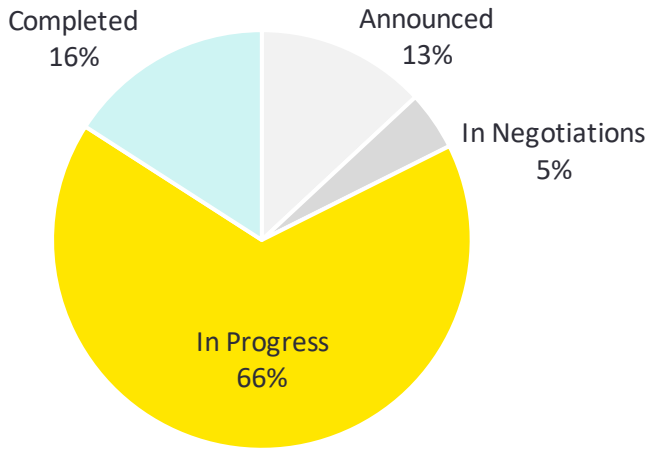
84% of survey respondents identified their ISI-funded project as still ongoing (i.e., either announced, in negotiations, or in progress). This finding informed the broad approach used to assess the ISI's impacts by highlighting that most project outcomes are yet to be realized. As a result, the anticipated outcomes identified by project leads were used as indicators of potential socioeconomic benefits that are expected to be generated by the ISI. For example, over 90% of project leads expect their project to create, maintain or upskill jobs, while more than 80% of leads expect to positively impact innovation ecosystems through their project.

Survey Respondents by Organization Size



Sources: Web Survey, EY Analysis

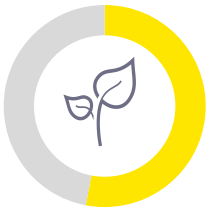
Survey Respondents by Current Project Status



Sources: Web Survey, EY Analysis

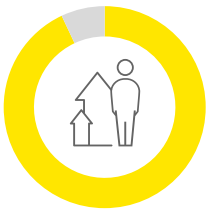
Notes: Analysis based on survey of 176 project partners across all five Superclusters. Responses collected August – September 2021.

Anticipated Project Benefits

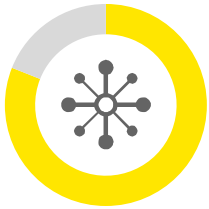


- **Environmental Impacts:** 53% of projects expect to create positive environmental impacts

- **Gender & Diversity Impacts:** 37% of projects anticipate resulting in improvements in participation of underrepresented groups



- **Job Creation:** 93% of projects anticipate resulting in new or improved job opportunities



- **Other Ecosystem Benefits:** 81% of projects expect to create other ecosystem benefits

Sources: Project Activity Reports (PARs), June 2019 – August 2021, EY Analysis

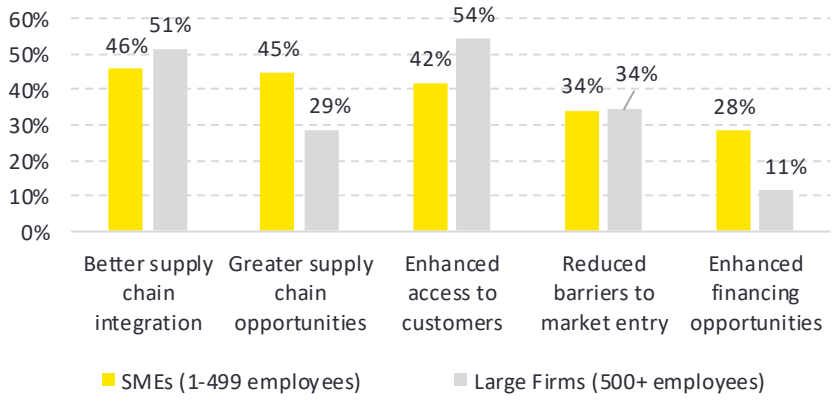
ISI Program Overview

Key Insights by Pillar

Economic Growth

The ISI provides growth opportunities to organizations through multiple avenues. SMEs participating in ISI-funded projects were more likely to anticipate growth benefits from improved supply chain and financing opportunities, while large firms were more likely to expect enhanced customer access.

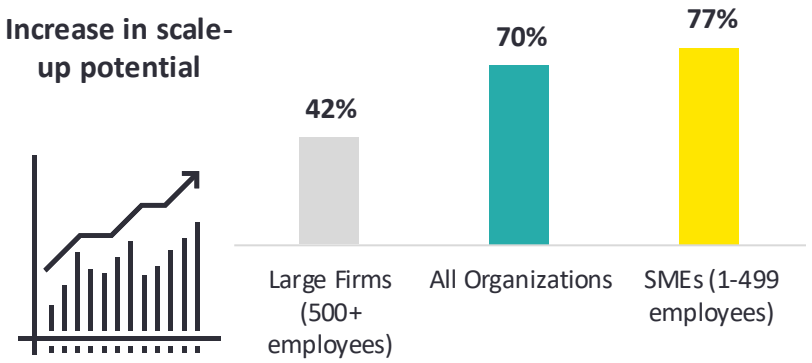
Q: Have you observed, or do you anticipate observing, any of the following growth outcomes as a result of your organization's participation in an ISI-funded project?[1]



Productivity

One of the ISI's primary productivity benefits is providing a launching pad for businesses, especially SMEs, to scale-up their activities. Through co-investment and the creation of consortiums, the ISI enables organizations to pursue projects that they may not have pursued otherwise and maximize their productive potential.

Q: Have you observed, or do you anticipate observing, any of the following productivity outcomes as a result of your organization's participation in an ISI-funded project?[2]



Innovation

The Global Innovation Index ranks Canada 22nd in the world in terms of innovation output.[3] *The ISI supports organizations as they pursue innovative ideas that can eventually become IP assets. Organizations are encouraged to develop a business case and focus on the pathway to commercialization from the earliest project stages.*

Q: Have you observed, or do you anticipate observing, any of the following innovation outcomes as a result of your organization's participation in an ISI-funded project?

68% of ongoing projects expect to create some form of **IP**[4]

500+ products, processes & services with commercial potential being developed or improved[5]

Sources: 1 Web Survey, August – September 2021 2 Web Survey, August – September 2021 3 Global Innovation Index 2020
4 Web Survey, August – September 2021 5 Project Activity Reports (PARs), June 2019 – August 2021

ISI Program Overview

Key Insights by Pillar

New Business Opportunities

New business opportunities will become key indicators of the ISI's total impact on the Canadian economy as more projects are completed. These metrics reflect how initial funding by the ISI can generate significant financial returns. International opportunities are particularly important for expanding Canada's global brand.

Q: Does your organization expect to receive any follow-on investment/anticipate accessing any new global markets as a result of its participation in an ISI-funded project?[6]

48% of ongoing projects expect to receive **follow-on investment** from Canadian or international investors

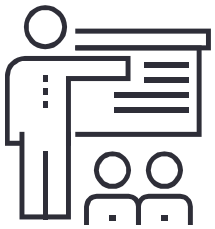
59% of ongoing projects expect to access **new global markets** (e.g., international export destinations)

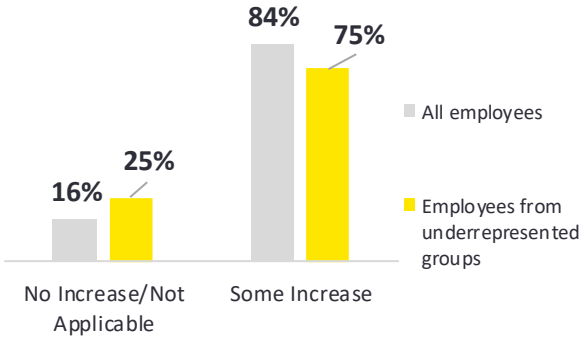
New Employment Opportunities

In addition to creating new jobs, the ISI's funded projects provide upskilling opportunities for existing workers. Enhanced training for employees from underrepresented groups is critical for Canada to benefit from its diverse workforce, which evidence shows can drive innovation and market growth.[8]

Q: To what extent has your organization provided increased training or upskilling opportunities for the following groups as a result of its participation in an ISI-funded project?[7]

Training & Upskilling





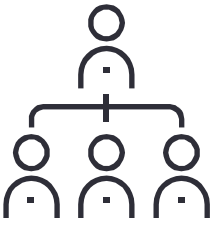
Social Capital

The ISI generates social capital through its unique focus on the power of partnerships. Surveyed organizations created an average of four partnerships through the ISI. Bringing together a diverse set of organizations with a common goal creates new connections that can expand the innovation ecosystem.

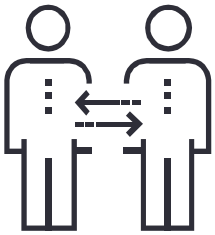
Q: Which types of organizations have you created partnerships with as a result of participation in an ISI-funded project?[9]

50%
Academic or Research institute

48%
SMEs (1-499 employees)



41%
For-profit firm in a different sector



Sources: 6 Web Survey, August – September 2021 7 Web Survey, August – September 2021 8 Harvard Business Review, "How Diversity Can Drive Innovation" 9 Web Survey, August – September 2021

ISI Program Overview

Short-Term Economic Impact Projections

The ISI is currently expected to create or sustain a total of **23,900 FTE jobs** in Canada's economy during its initial funding period from FY 2018-19 to FY 2022-23. Short-term employment contributions were projected based on estimates of total spending for ISI-funded projects. Approximately $1.6 billion in project spending is expected over the period, including contributions from Superclusters and project partners. This total includes traditionally-funded projects from all Superclusters as well as projects launched under the COVID-19 stream by the Digital, Scale AI, and NGen Superclusters.

Project Spending

Direct, indirect, and induced impacts

Total spending to conduct various projects and programs generate significant economic benefits for the national economy.

$1.6B
in total project spending

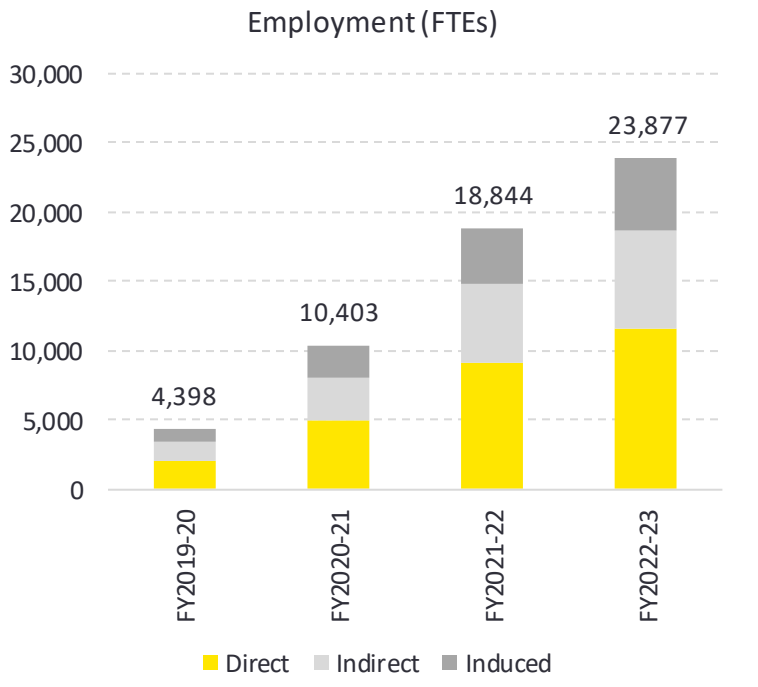
Total project spending includes approximately **$609 million in ISI contributions** made to funded projects

Cumulative Economic Contributions (FY 2018-19 to FY 2022-23)	Employment (FTEs)
Direct	11,683
Indirect	7,074
Induced	5,120
Total	**23,877**

Sources: Project Activity Reports (PARs), June 2019 – August 2021

Cumulative Economic Contributions by Fiscal Year

- The ISI's project spending is expected to provide direct employment opportunities across a number of job fields, including:
  - Engineering
  - Information Technology
  - Physical Sciences
  - Sales & Marketing
- Indirect employment opportunities represent jobs generated or sustained by the activities of suppliers that provide goods (e.g., equipment) and services (e.g., subcontracting) for the Supercluster-funded projects.
- Induced employment opportunities include jobs generated or sustained by workers from directly or indirectly impacted sectors spending their earnings on consumer goods and services.



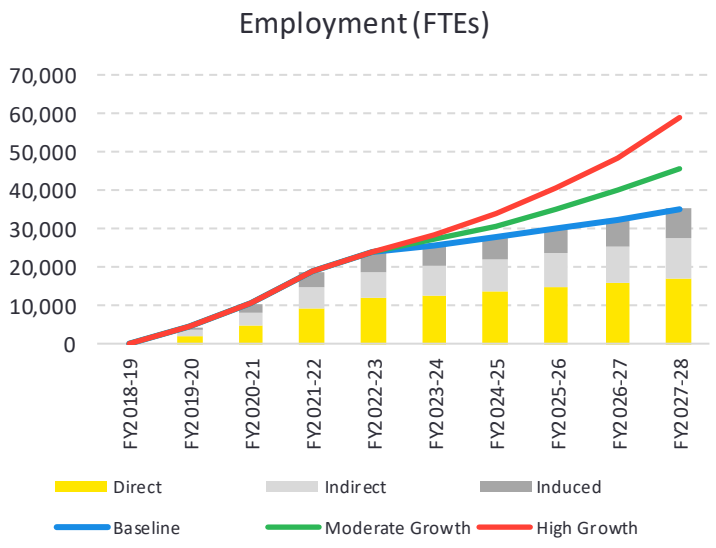
Sources: Project Activity Reports (PARs), June 2019 – August 2021; ISED data; Statistics Canada; and EY analysis.

Notes: Full Time Equivalent person-years based on the number of hours equivalent to full-time employment over the period of time.

Long-Term Economic Impact Projections

Long-term employment contributions were projected by extending the short-term impact projections using composite growth rates that are specific to each Supercluster's project portfolio. Each funded project was reviewed and assessed for its long-term potential; projects expected to have sustained impact were mapped to their corresponding industries. Composite growth rates were developed based on data from research reports regarding expected market growth for the mapped industries. Scenario analysis was also conducted to illustrate how changes in technology adoption rates could affect the ISI's projected impacts.

Cumulative Economic Contributions (FY 2018-19 to FY 2027-28)



Employment (FTEs)

	Baseline	Moderate Growth	High Growth
Direct	17,130	22,346	28,944
Indirect	10,371	13,409	17,235
Induced	7,538	9,768	12,579
Total	**35,039**	**45,523**	**58,758**

The ISI's cumulative projected impacts on the Canadian economy between FY 2018-19 and FY 2027-28 include:

- **35,000 total FTE jobs** in the baseline scenario. In this scenario, technology adoption is anticipated to increase at its current pace over the forecast period.
- **45,500 total FTE jobs** in the moderate growth scenario. In this scenario, technology adoption is anticipated to increase moderately faster than its current pace over the forecast period.
- **58,800 total FTE jobs** in the high growth scenario. In this scenario, technology adoption is anticipated to increase significantly faster than its current pace during the forecast period.

Sources: Project Activity Reports (PARs), June 2019 – August 2021; ISED data; Statistics Canada; Industry research reports; and EY analysis.

Notes: FTE person-years based on the number of hours equivalent to full-time employment over the period of time.
Direct impacts are supported by project spending. Indirect impacts are supported by activities of goods and services suppliers (e.g., retail, professional services). Induced impacts are supported by employees spending their salaries on domestic consumption (e.g., food & beverage, banking services).

4 Supercluster Insights and Analysis

The Superclusters deliver on the Government of Canada's vision for the ISI through their funding and support for projects and programs. They offer a wide range of unique benefits to participating organizations, including co-investment, collaborative opportunities, commercialization support, and ecosystem development. The activities and outcomes of funded projects, in turn, enable broader socioeconomic gains across the Canadian economy.

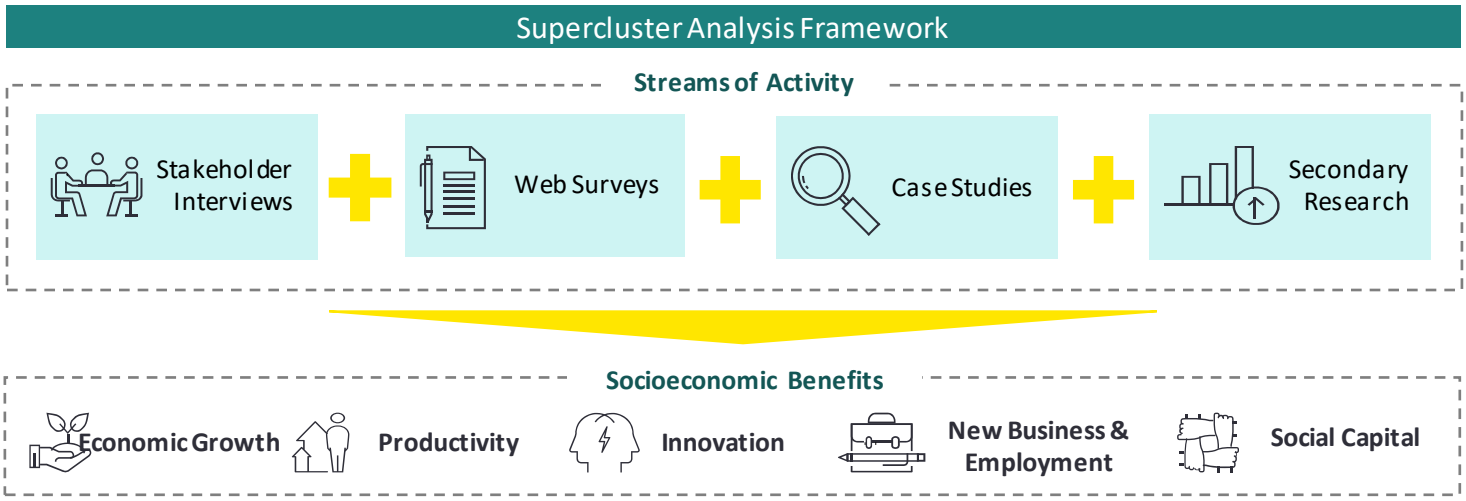
Funding and support **encourages organizations to make investments** despite the typically conservative Canadian investment environment

Forming partnerships between industry and academia creates **unique collaborative opportunities** with benefits for all parties

Focusing on **commercialization of products, processes, and services** is critical to build Canada's global position in key sectors

Communities benefit from **ecosystem development** through the creation of networks that can be accessed by underrepresented groups

Detailed insights and analysis for each Supercluster are included in this section. Socioeconomic benefits are described using a combination of qualitative and quantitative findings based on the framework illustrated below:



Supercluster-specific economic contribution analysis results are also provided in this section. Short-term and long-term impact projections are summarized separately for each Supercluster. Descriptions of the factors that influenced each set of projections are included alongside data tables and summary graphics.

4.1 Next Generation Manufacturing Canada

Next Generation Manufacturing Canada ("NGen") is the organization leading Canada's Advanced Manufacturing Supercluster. NGen's mission is to build world-leading advanced manufacturing capabilities in several domains, including robotics, 3D printing, and more. With over 4,000 active members, NGen also works to strengthen Canada's advanced manufacturing ecosystem.

NGen's funding and support have enabled a range of benefits for organizations participating in projects, for the advanced manufacturing sector, and for all Canadians

Key Facts and Figures

- ***$429 million*** of total project investment, including NGen funding and project partner contributions[1]
- ***81 products, processes and services*** will be developed, improved and/or commercialized[2]
- ***200 new IP assets*** created through NGen's funded projects[3]
- Member organizations have formed an average of ***4 new partnerships*** through its projects[4]

Reducing Risk

- Funding and support is necessary to promote investments by organizations in the normally conservative Canadian investment environment

Improving Competitiveness

- NGen improves Canada's competitive position within the global manufacturing landscape by supporting sectoral development

Enabling Business Transformation

- NGen prioritizes disruptive technology projects with the potential to transform business activities in the spaces they operate

Promoting Collaboration

- Partnerships between a diverse set of organizations offer mutually beneficial opportunities for innovation and business development

Facilitating Commercialization

- NGen facilitates commercialization through its support of project teams in developing strategies for IP management

Developing Networks for SMEs

- By developing Canada's advanced manufacturing ecosystem, NGen provides a readymade network that is easily accessible to SMEs

Supporting COVID-19 Response

- NGen launched challenges to develop and manufacture critical products and supported organizations as they transitioned to a virtual business environment

NGen Next Generation Manufacturing Canada

Source: NGen

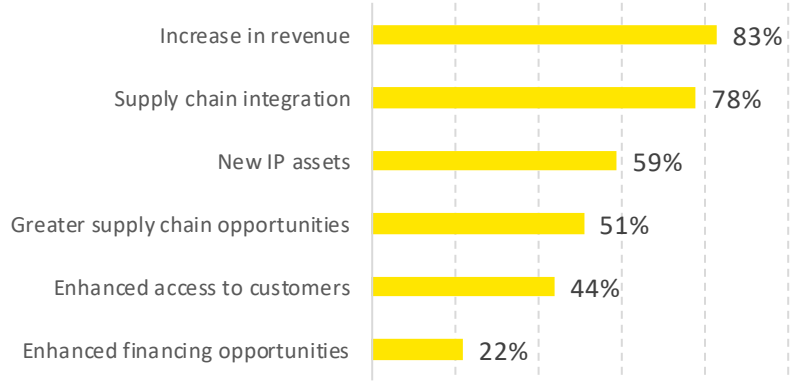
Sources: 1 Project Activity Reports (PARs), June 2019 – August 2021 2 PARs, June 2019 – August 2021 3 Innovation, Science and Economic Development Canada 4 Web Survey, August – September 2021

Key Insights by Pillar

Economic Growth

NGen stimulates economic growth by providing co-investment for advanced manufacturing projects that develop new technologies or adopt existing technologies to solve a new industrial problem. NGen's multifaceted growth strategy is reflected in the benefits organizations expect to achieve through their projects.

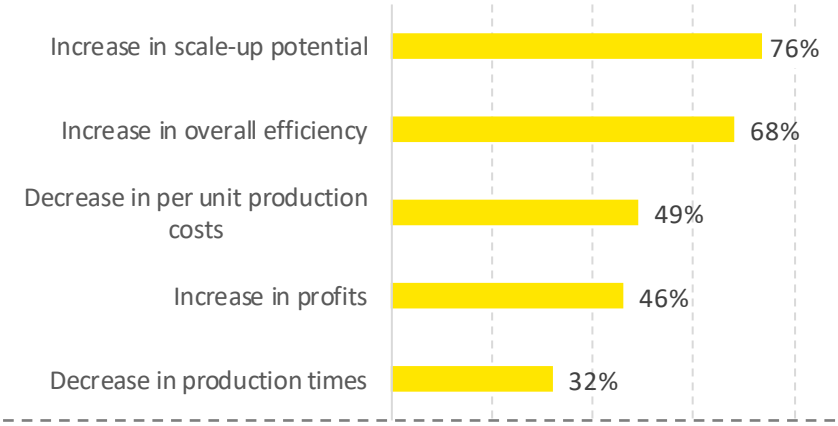
Q: Have you observed, or do you anticipate observing, any of the following growth outcomes as a result of your organization's participation in an ISI-funded project?[1]



Productivity

Among NGen's project partners, productivity metrics indicate how performance is expected to improve due to the technological advancements achieved through their projects. Organizations involved in NGen projects expect to experience productivity gains most commonly as a result of an increase in scale-up potential.

Q: Have you observed, or do you anticipate observing, any of the following productivity outcomes as a result of your organization's participation in an ISI-funded project?[2]



Innovation

NGen's IP Strategy provides clear policies and structures for IP management to their project partners. NGen also offers direct support to organizations implementing their IP strategies, including SMEs who may lack capabilities in this area. 81 products, processes, and services will be brought to market as a result of NGen's funded projects.

Q: Have you observed, or do you anticipate observing, any of the following innovation outcomes as a result of your organization's participation in an ISI-funded project?

66% of organizations have generated or will generate **IP**[3]

25 products **42** processes **14** services

will be developed, improved and/or commercialized[4]

Sources: 1 Web Survey, August – September 2021 2 Web Survey, August – September 2021 3 Web Survey, August – September 2021
4 Project Activity Reports (PARs), June 2019 – August 2021

NGen Next Generation Manufacturing Canada

Key Insights by Pillar

New Business Opportunities

NGen's funded projects have provided a launching pad for organizations to accelerate the process of accessing capital funding, identifying new technology applications, and expanding export destinations. Through their work with NGen, project partners have been able to access follow-on investment and foster connections in new global markets.

Q: Does your organization expect to receive any follow-on investment/anticipate accessing any new global markets as a result of its participation in an ISI-funded project?[5]

49% of ongoing projects expect to receive **follow-on investment** from Canadian or international investors

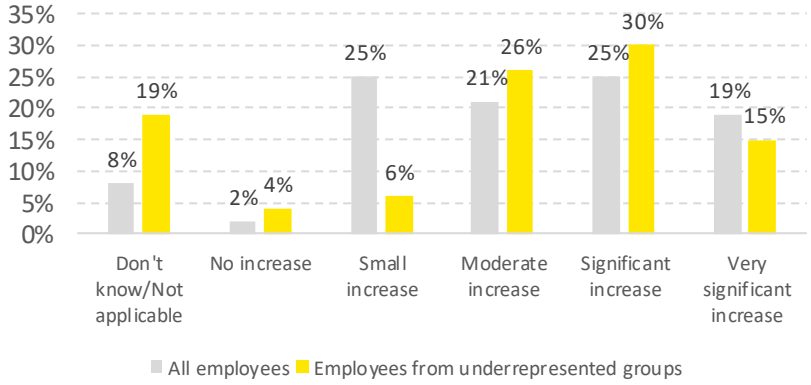
64% of ongoing projects expect to access **new global markets** (e.g., international export destinations)

New Employment Opportunities

96% of NGen projects expect job creation to be one of the benefits of their work.

58% of jobs created will be filled by Highly Qualified Personnel. Examples of job titles that project partners have hired, or plan to hire, include: software engineer, R&D scientist, laboratory manager, chief commercial officer, and robotics engineer.

Q: To what extent has your organization provided increased training or upskilling opportunities for the following groups as a result of its participation in an ISI-funded project?[6]



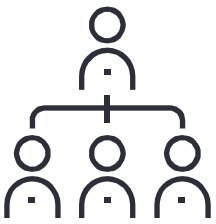
Social Capital

NGen's collaborative projects have resulted in hundreds of new partnerships that have expanded the manufacturing ecosystem.

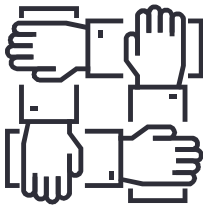
52% of organizations reported additional ecosystem development interactions annually as a result of NGen activities, and 89% of these organizations expect to sustain the partnerships

Q: Which types of organizations have you created partnerships with as a result of participation in an ISI-funded project?[7]

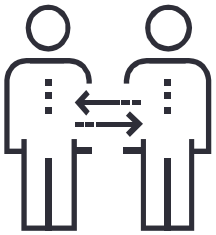
53%
SMEs (1-499 employees)



45%
For-profit firm in the same sector



38%
For-profit firm in a different sector



Sources: 5 Web Survey, August – September 2021 6 Web Survey, August – September 2021 7 Web Survey, August – September 2021

EY

4.2 Digital Technology Supercluster

The Digital Technology Supercluster ("Digital") aims to unlock the potential of data through the development, deployment, and scaling of Canadian-made digital technologies. The Supercluster creates digital solutions across sectors via its Precision Health, Digital Twins, and Data Commons program streams. It also builds the pipeline for a diverse STEM workforce through its Capacity Building program.

Digital's funding and support have enabled a range of benefits for organizations participating in projects, for members of the digital innovation ecosystem, and for all Canadians

Key Facts and Figures

- ***$302 million*** of total project investment, including Digital funding and project partner contributions[1]
- ***132 products, processes and services*** will be developed, improved and/or commercialized[2]
- ***184 new IP assets*** created through Digital's funded projects[3]
- Member organizations have formed an average of ***6 new partnerships*** through their projects[4]

Supporting R&D Investment Growth

- Digital's investments in the digital innovation ecosystem are working to counteract declining trends in Canadian Research and Development ("R&D") investment

Creating Diverse Partnerships

- Digital has provided a new mechanism for collaborative opportunities that quickly bring together industry and academia

Accelerating Skills Development

- Digital's funded projects offer rapid skills development opportunities through the process of applying new technologies to solve real-world business problems

Promoting Commercialization

- Digital promotes commercialization by providing strategic support to develop and protect IP assets

Promoting SMEs

- Digital has provided a national platform for SMEs to gain recognition for their efforts, such as being mentioned by the Prime Minister, Justin Trudeau

Building the Talent Pipeline

- Digital's Capacity Building program provides outreach that creates a pathway for members of underrepresented groups to enter the digital innovation ecosystem

Supporting COVID-19 Response

- Digital's COVID-19 Response program addressed a broad range of pandemic impacts (e.g., emergency response, healthcare resiliency, return to work, economic recovery)

CANADA'S DIGITAL TECHNOLOGY SUPERCLUSTER

Source: Digital Technology Supercluster

Sources: 1 Project Activity Reports (PARs), June 2019 – August 2021 2 PARs, June 2019 – August 2021 3 Innovation, Science and Economic Development Canada 4 Web Survey, August – September 2021

Digital Technology

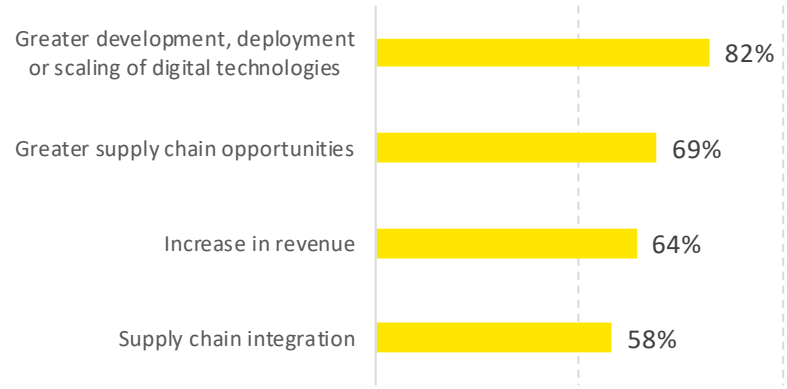
CANADA'S DIGITAL TECHNOLOGY SUPERCLUSTER

Key Insights by Pillar

Economic Growth

The Digital Technology Supercluster catalyzes growth by filling this role through its strategic project funding and outreach. Digital also supports growth by requiring project partners to build the business case for their ideas. This experience is critical for organizations, particularly SMEs, to be prepared for future growth opportunities.

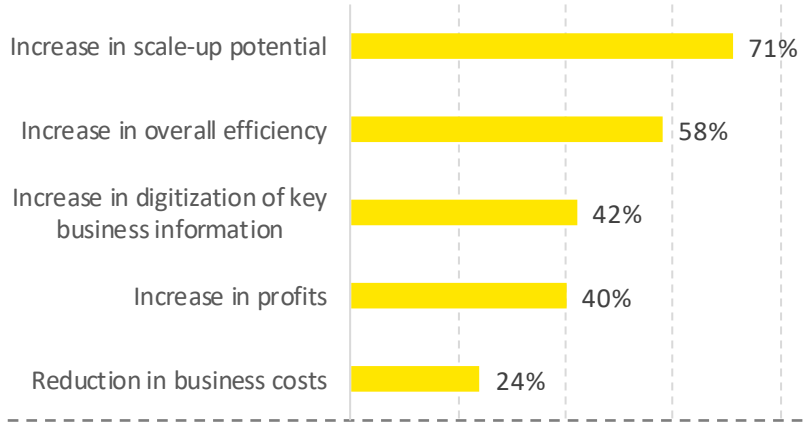
Q: Have you observed, or do you anticipate observing, any of the following growth outcomes as a result of your organization's participation in an ISI-funded project?[1]



Productivity

Digital enables productivity by building consortiums that bring organizations with complementary expertise together. Digital connects technically-oriented businesses with companies from target sectors like healthcare and natural resources, leading to productivity gains by turning knowledge transfer directly to real-world action.

Q: Have you observed, or do you anticipate observing, any of the following productivity outcomes as a result of your organization's participation in an ISI-funded project?[2]



Innovation

Digital's approach to innovation is informed by collaboration and aims to bring organizations together that can create a foundation of intangible assets. Digital's funding for projects with commercial aims allows organizations to develop disruptive technologies while maintaining their typical business activities.

Q: Have you observed, or do you anticipate observing, any of the following innovation outcomes as a result of your organization's participation in an ISI-funded project?

64% of organizations have generated or will generate **IP**[4]

37 products **11** processes **84** services

will be developed, improved and/or commercialized

Sources: 1 Web Survey, August – September 2021 2 Web Survey, August – September 2021 3 Web Survey, August – September 2021
4 Project Activity Reports (PARs), June 2019 – August 2021

EY

Key Insights by Pillar

New Business Opportunities

Funded projects bridge the gap between research and commercialization activities, creating a stronger value proposition for future business opportunities. Through their work with Digital, project partners have been able to access follow-on investment, identify new global markets and, in some cases, foster connections to enter these markets.

Q: Does your organization expect to receive any follow-on investment/anticipate accessing any new global markets as a result of its participation in an ISI-funded project?[5]

45% of ongoing projects expect to receive **follow-on investment** from Canadian or international investors

45% of ongoing projects expect to access **new global markets** (e.g., international export destinations)

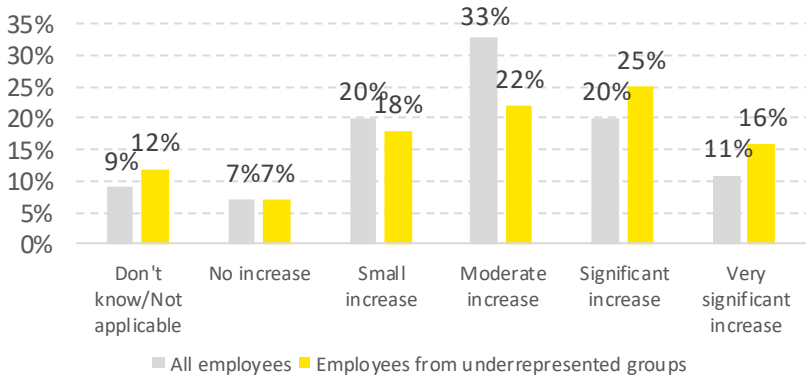
New Employment Opportunities

95% of Digital projects expect job creation to be one of the benefits of their work.

78% of jobs created will be filled by Highly Qualified Personnel.

Examples of job titles that project partners have hired, or plan to hire, include: software developer, data scientist, UI/UX Designer, and product analyst.

Q: To what extent has your organization provided increased training or upskilling opportunities for the following groups as a result of its participation in an ISI-funded project?[6]



Social Capital

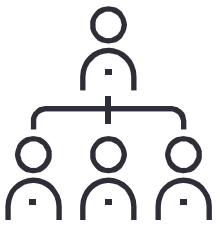
Digital's collaborative projects provide a safe haven for organizations that would traditionally compete with one another.

52% of organizations reported additional ecosystem development interactions annually as a result of Digital activities, and 91% of these organizations expect to sustain the partnerships.

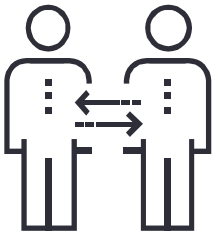
Q: Which types of organizations have you created partnerships with as a result of participation in an ISI-funded project?[7]

73%
Academic or Research institute

47%
SMEs (1-499 employees)



40%
For-profit firm in a different sector



Sources: 5 Web Survey, August – September 2021 6 Web Survey, August – September 2021 7 Web Survey, August – September 2021

4.3 Protein Industries Canada

Protein Industries Canada ("PIC") is the national innovation Supercluster focused on accelerating the growth of the Canadian plant protein sector. By positioning Canada as a global leader in the production of plant-based products and co-products, PIC hopes to capture a larger piece of a rapidly growing premium market. PIC's program streams (Create, Grow, Make, Sell) reflect the stages of the agribusiness supply chain.

PIC's funding and support have enabled a range of benefits for organizations participating in projects, for businesses operating in the plant protein sector, and for all Canadians

Key Facts and Figures

- ***$334 million*** of total project investment, including PIC funding and project partner contributions[1]
- ***352 products, processes and services*** will be developed, improved and/or commercialized[2]
- ***66 new IP assets*** created through PIC's funded projects[3]
- Member organizations have formed an average of ***5 new partnerships*** through its projects[4]

Raising Awareness

- PIC's ecosystem development activities have built knowledge of the plant protein expertise that exists across Canada

Connecting the Value Chain

- PIC includes members of each stage of the value chain in its projects and outreach activities which strengthens the connections between these groups

Building Productive Capacity

- PIC's funded projects have allowed organizations to scale up their businesses in terms of facilities and staff which ultimately boost their productive capacity

Keeping Pace Globally

- PIC helps organizations to navigate the rapidly evolving global market for plant-based products and builds Canada's reputation as a global leader

Promoting Commercialization

- PIC's funded projects have provided opportunities for organizations to develop a significant number of new products, processes and services for the market

Creating Job Opportunities

- PIC's project support also creates employment and training opportunities, especially with respect to novel scientific applications

PROTEIN INDUSTRIES CANADA

Source: PIC

Sources: 1 Project Activity Reports (PARs), June 2019 – August 2021 2 PARs, June 2019 – August 2021 3 Innovation, Science and Economic Development Canada 4 Web Survey, August – September 2021

Protein Industries Canada

PROTEIN INDUSTRIES CANADA

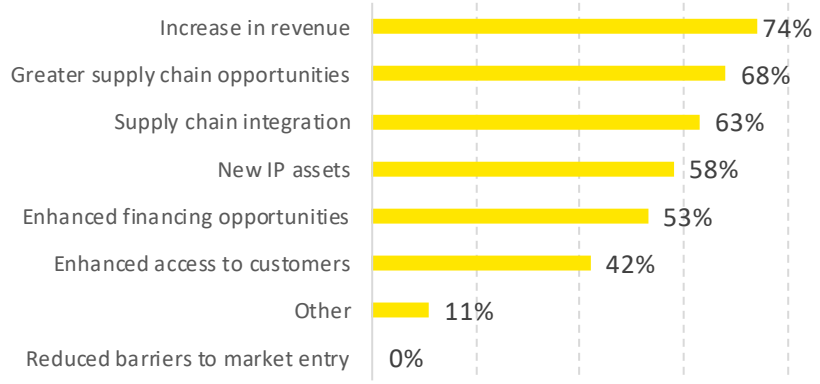
Key Insights by Pillar

Economic Growth

PIC's project funding and outreach activities are crucial in creating a sense of urgency among Canadian businesses to take advantage of the rise of plant-based products and establish a global position.

PIC generates growth opportunities on a global scale by cultivating a market for Canadian goods and services in the plant protein sector.

Q: Have you observed, or do you anticipate observing, any of the following growth outcomes as a result of your organization's participation in an ISI-funded project?[1]

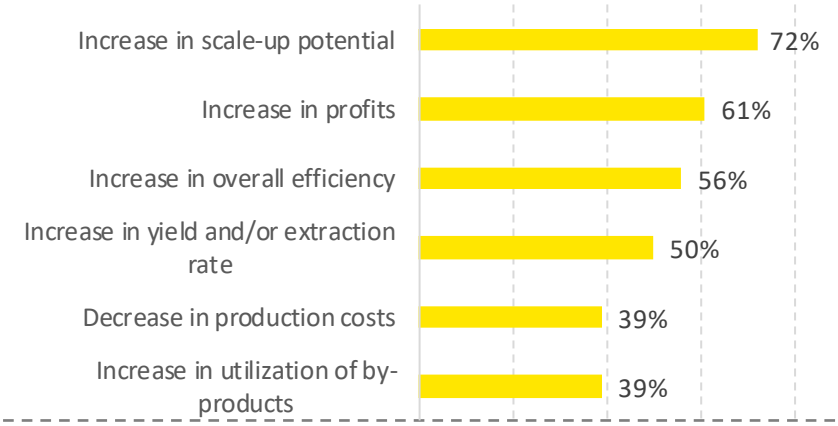


Productivity

PIC helps companies make the biggest jump in the lifecycle of their ideas by providing project funding to move from the pilot stage to mass production.

This support is critical for businesses to overcome common scaling hurdles with processes, equipment, and product formulation.

Q: Have you observed, or do you anticipate observing, any of the following productivity outcomes as a result of your organization's participation in an ISI-funded project?[2]



Innovation

PIC's focus on IP and commercialization reflects the importance of innovation for the sector. PIC's funding has accelerated the development of hundreds of products, processes, and services with commercial potential by supporting access to specialized services, equipment and facilities for R&D.

Q: Have you observed, or do you anticipate observing, any of the following innovation outcomes as a result of your organization's participation in an ISI-funded project?

57% of organizations have generated or will generate **IP**[3]

248 products

90 processes

14 services

will be developed, improved and/or commercialized[4]

Sources: 1 Web Survey, August – September 2021 2 Web Survey, August – September 2021 3 Web Survey, August – September 2021
4 Project Activity Reports (PARs), June 2019 – August 2021

EY

Key Insights by Pillar

New Business Opportunities

PIC's funded projects have drawn international attention to Canada's plant protein sector which will be key to capitalizing on this rapidly evolving opportunity.

Through their work with PIC, project partners have been able to access follow-on investment from Canadian and international investors and expect to access new global markets.

Q: Does your organization expect to receive any follow-on investment/anticipate accessing any new global markets as a result of its participation in an ISI-funded project?[5]

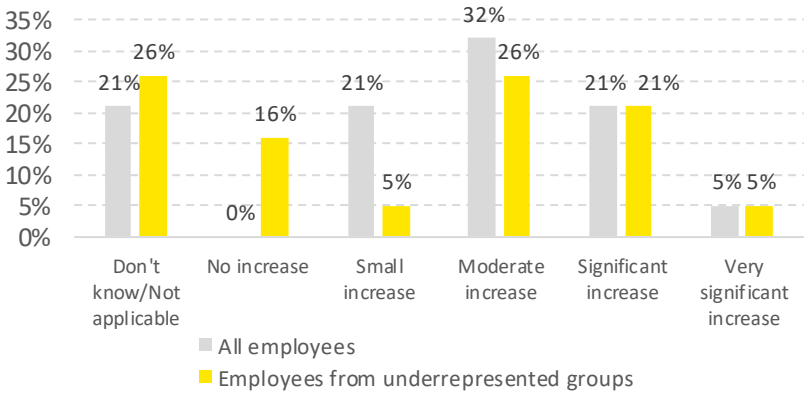
50% of ongoing projects expect to receive **follow-on investment** from Canadian or international investors

65% of ongoing projects expect to access **new global markets** (e.g., international export destinations)

New Employment Opportunities

PIC's projects have led to new job opportunities for highly-skilled technical labour, especially those in R&D roles related to engineering and laboratory-based research. Examples of job titles that project partners have hired, or plan to hire, include: production manager, research agronomist, organic chemist, and business development lead.

Q: To what extent has your organization provided increased training or upskilling opportunities for the following groups as a result of its participation in an ISI-funded project?[6]



Social Capital

PIC's projects and activities have created new partnerships across sectors and raised awareness of the expertise that exists in the plant protein sector.

67% of organizations reported additional ecosystem development interactions annually as a result of PIC activities, and 74% of these organizations expect to sustain the partnerships.

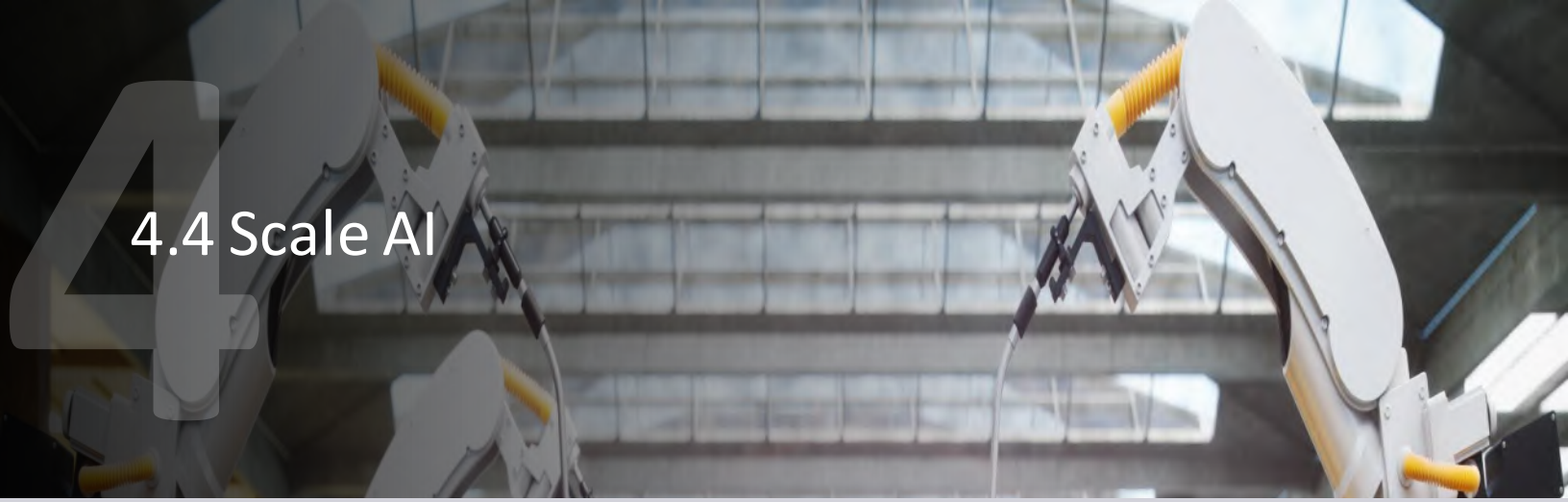
Q: Which types of organizations have you created partnerships with as a result of participation in an ISI-funded project?[7]

58% **For-profit firm in the same sector**

47% **For-profit firm in a different sector**

42% **Academic or Research institute**

Sources: 5 Web Survey, August – September 2021 6 Web Survey, August – September 2021 7 Web Survey, August – September 2021



4.4 Scale AI

Scale AI is Canada's innovation Supercluster for the rapid adoption and integration of Artificial Intelligence ("AI") into supply chains. Scale AI connects a wide range of sectors through its development of intelligent supply chains, including retail, manufacturing, transportation, infrastructure and technology. The business solutions enabled through Scale AI's activities allow organizations of all sizes to grow.

Scale AI's funding and support have enabled a range of benefits for organizations participating in projects, for supply chains across sectors, and for all Canadians

Key Facts and Figures

- ***$254 million*** of total project investment, including Scale AI funding and project partner contributions[1]
- ***405 new IP assets*** created through Scale AI's funded projects[2]
- Member organizations have formed an average of ***3 new partnerships*** through its projects[3]
- ***94%*** of organizations expect to sustain partnerships formed through Scale AI[4]

Optimizing Business Processes

- Scale AI funds projects that prioritize AI integration to create more efficient and effective business processes across sectors

Reducing Risk

- By providing co-investment for projects, Scale AI provides opportunities for organizations that may not have pursued AI integration otherwise

Scaling Businesses

- Many of Scale AI's project partners are smaller organizations that can potentially gain new clients and markets by collaborating with larger firms

Enhancing Skills

- Integrating AI into business processes allows individuals without prior technical knowledge to gain valuable experience and develop new competencies

Sharing Knowledge

- In lieu of patents, many partner organization instead agree to share information and/or data developed as a by-product of their collaboration on projects

Developing the Ecosystem

- Scale AI's projects and outreach events foster connections between a diverse set of stakeholder groups who are able to build a network for future opportunities

Supporting COVID-19 Response

- Scale AI's COVID-19 Response program stream provided funding for projects that use AI and other digital tools to support pandemic interventions

Source: Scale AI

Sources: 1 Project Activity Reports (PARs), June 2019 – August 2021 2 Innovation, Science and Economic Development Canada
3 Web Survey, August – September 2021 4 Web Survey, August – September 2021

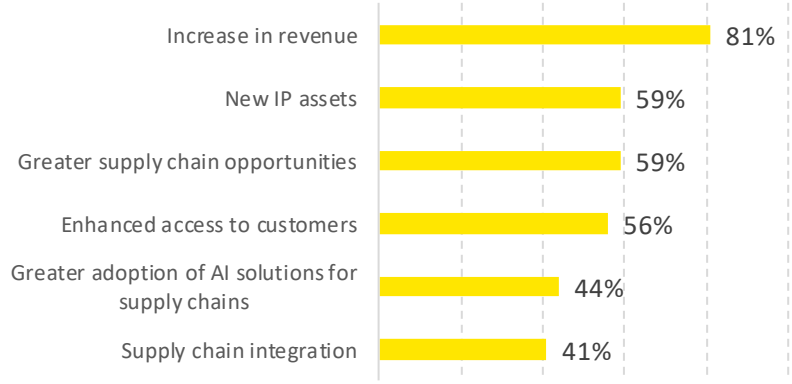
Scale AI

Key Insights by Pillar

Economic Growth

Scale AI shows potential adopters the positive impact that AI can bring to supply chains through the efficiency gains of their projects. Scale AI also creates links between industries to drive supply chain development and boost acquisition and retention of talent. Scale AI mitigates risk by providing co-investment for projects.

Q: Have you observed, or do you anticipate observing, any of the following growth outcomes as a result of your organization's participation in an ISI-funded project?[1]

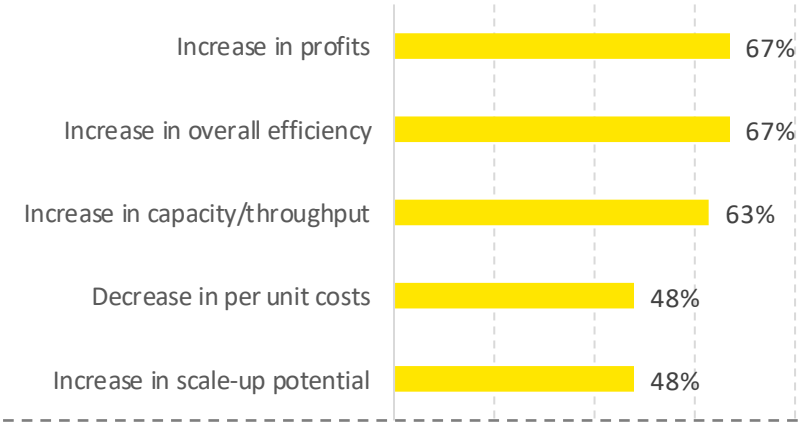


Productivity

Scale AI's funded projects provide the promise of significant productivity gains for participating organizations through the integration of AI into supply chains.

Businesses can achieve their productive potential by relying on AI to drive decisions that are typically made based on structured data.

Q: Have you observed, or do you anticipate observing, any of the following productivity outcomes as a result of your organization's participation in an ISI-funded project?[2]



Innovation

Scale AI conceives of the innovation ecosystem as a triangle consisting of researchers, industry, and start-ups. Scale AI's goal is to strengthen each of the three corners as well as the links between them in order to bring these innovations to market. Innovation within Scale AI's projects is often centred around business solutions instead of products.

Q: Have you observed, or do you anticipate observing, any of the following innovation outcomes as a result of your organization's participation in an ISI-funded project?

58% of organizations have generated or will generate **IP**[3]

Ecosystem Development Priorities[4]

Sources: 1 Web Survey, August – September 2021 2 Web Survey, August – September 2021 3 Web Survey, August – September 2021
4 PARs, June 2019 – August 2021

Scale AI

Key Insights by Pillar

New Business Opportunities

Project partners, especially SMEs and those involved with AI development, have received exposure to new industries and sectors where they can apply their technologies.

The experiences gained during these projects enable businesses to establish a brand that can attract new customers.

Q: Does your organization expect to receive any follow-on investment/anticipate accessing any new global markets as a result of its participation in an ISI-funded project?[5]

50% of ongoing projects expect to receive **follow-on investment** from Canadian or international investors

65% of ongoing projects expect to access **new global markets** (e.g., international export destinations)

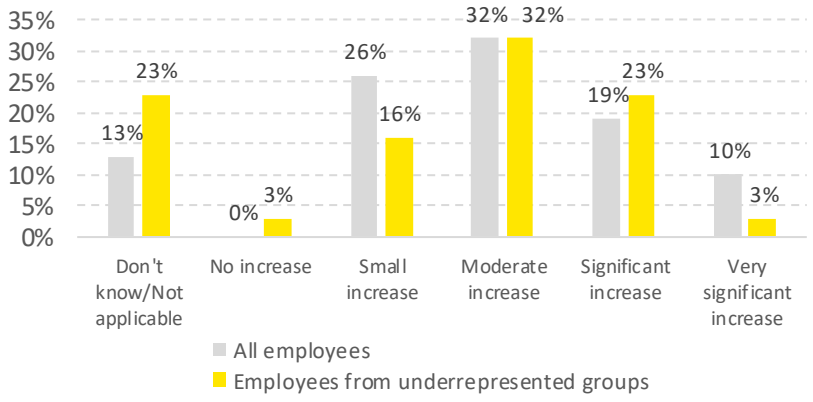
New Employment Opportunities

92% of Scale AI's projects expect job creation to be one of the benefits of their work.

86% of jobs created will be filled by Highly Qualified Personnel.

Examples of job titles that project partners have hired, or plan to hire, include data scientists, optimization develop, senior simulation engineer, and IT project manager.

Q: To what extent has your organization provided increased training or upskilling opportunities for the following groups as a result of its participation in an ISI-funded project?[6]



Social Capital

Scale AI's projects and outreach events strengthen supplier to consumer connections and add new dimensions through the inclusion of research organizations, accelerators, and AI-based SMEs.

39% of Scale AI's projects have created new partnerships between companies in industries that rely on supply chains, and 94% of these organizations expect to sustain the partnerships.

Q: Which types of organizations have you created partnerships with as a result of participation in an ISI-funded project?[7]

52%
SMEs (1-499 employees)

48%
Large firm (500+ employees)

45%
Academic or Research institute

Sources: 5 Web Survey, August – September 2021 6 Web Survey, August – September 2021 7 Web Survey, August – September 2021

4.5 Canada's Ocean Supercluster

Canada's Ocean Supercluster ("OSC") prioritizes driving growth for businesses operating in Canada's oceans, from fisheries and shipbuilders to ocean technology and energy companies. The OSC pursues a vision of digital, sustainable, and inclusive growth by leveraging digital solutions and uniting stakeholders with a shared mission: building on Canada's strengths to capitalize on the global ocean economy's potential.

The OSC's funding and support have enabled a range of benefits for organizations participating in projects, for businesses operating in the ocean economy, and for all Canadians

Key Facts and Figures

- ***$290 million*** of total project investment, including the OSC's funding and project partner contributions[1]
- ***54 products, processes and services*** will be developed, improved and/or commercialized[2]
- ***8 new IP assets*** created through the OSC's funded projects[3]
- Member organizations have formed an average of ***3 new partnerships*** through its projects[4]

Raising Awareness

- The OSC's communications strategy reaches a global audience by shining a spotlight on key projects, programs, and activities that attract significant international interest

Capturing Opportunities

- The OSC provides funding and support for Canadian businesses to capitalize on current and future opportunities in the global ocean economy

Driving Growth

- By providing access to funding and creating connections to new customers, the OSC creates an environment where organizations can grow

Promoting Commercialization

- Several products, processes, and services have, or will be, brought to market as a result of the OSC's focus on the commercial aspects of innovation

Enhancing Skills

- The OSC's projects create skill development opportunities for new and existing workers, including those from underrepresented groups (e.g., Indigenous peoples)

Expanding the Ecosystem

- The cross-sectoral and pan-Canadian partnerships facilitated by the OSC have broadened networks for members of the ocean economy

Supporting COVID-19 Response

- The OSC pivoted its programming to support SMEs and maintain jobs through higher reimbursement rates and reduced requirements

CANADA'S OCEAN SUPERCLUSTER

Source: OSC

Sources: 1 Project Activity Reports (PARs), June 2019 – August 2021 2 PARs, June 2019 – August 2021 3 Innovation, Science and Economic Development Canada 4 Web Survey, August – September 2021

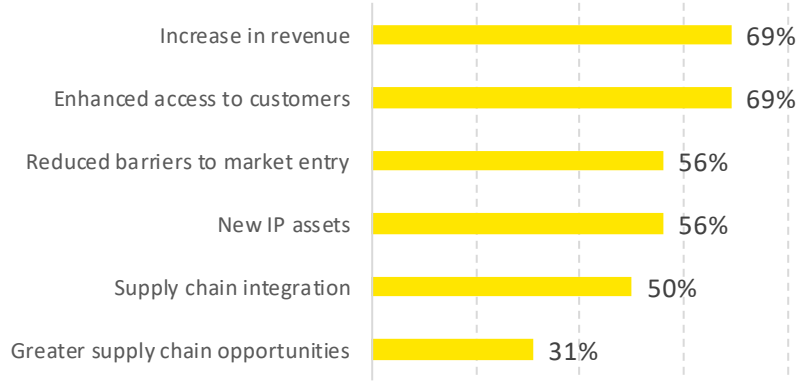
Canada's Ocean Supercluster

Key Insights by Pillar

Economic Growth

The OSC supports economic growth for Canada's ocean economy in part by funding projects that build new supply chains or enhance existing ones. The OSC's cross-sectoral projects create technology-based solutions to access new customers, boosting revenue and driving growth. The OSC creates an environment that is favourable for growth.

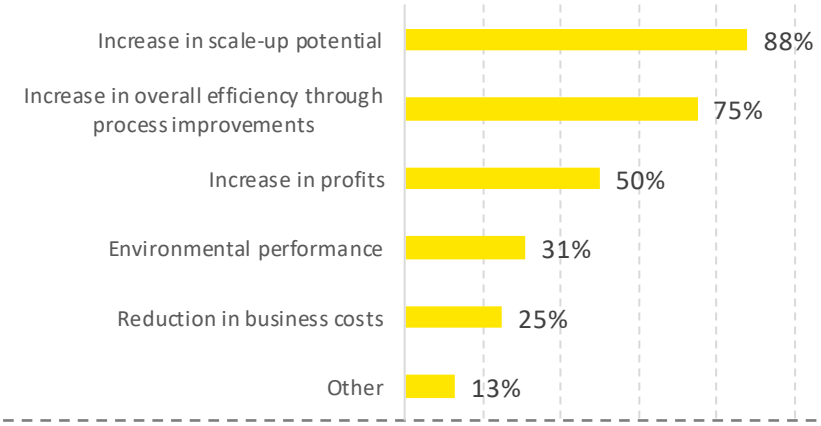
Q: Have you observed, or do you anticipate observing, any of the following growth outcomes as a result of your organization's participation in an ISI-funded project?[1]



Productivity

The OSC's vision for the ocean economy includes enabling the use of sustainable technologies, such as digital twins and advanced sensors, to create productivity gains for ocean businesses in Canada and across the world. The OSC funds projects that aim to improve the efficiency of business operations for a wide range of sectors.

Q: Have you observed, or do you anticipate observing, any of the following productivity outcomes as a result of your organization's participation in an ISI-funded project?[2]



Innovation

Innovation ecosystem development is a major focus of the OSC's projects and activities.

Ecosystem development occurs in part through the OSC's commitment to building cross-sector project partnerships that will engage in collaborative R&D, ultimately leading to IP and commercialization.

Q: Have you observed, or do you anticipate observing, any of the following innovation outcomes as a result of your organization's participation in an ISI-funded project?

75% of organizations have generated or will generate **IP**[3]

29 products **6** processes **19** services

will be developed, improved and/or commercialized[4]

Sources: 1 Web Survey, August – September 2021 2 Web Survey, August – September 2021 3 Web Survey, August – September 2021
4 Project Activity Reports (PARs), June 2019 – August 2021

Canada's Ocean Supercluster

Key Insights by Pillar

New Business Opportunities

The OSC's projects are designed to capitalize on market gaps in the ocean economy via collaborative, commercialization-focused activity conducted at a globally competitive scale and level of quality. Through their work with the OSC, project partners anticipate being able to access follow-on investment and identify new markets.

Q: Does your organization expect to receive any follow-on investment/anticipate accessing any new global markets as a result of its participation in an ISI-funded project?[5]

44% of ongoing projects expect to receive **follow-on investment** from Canadian or international investors

50% of ongoing projects expect to access **new global markets** (e.g., international export destinations)

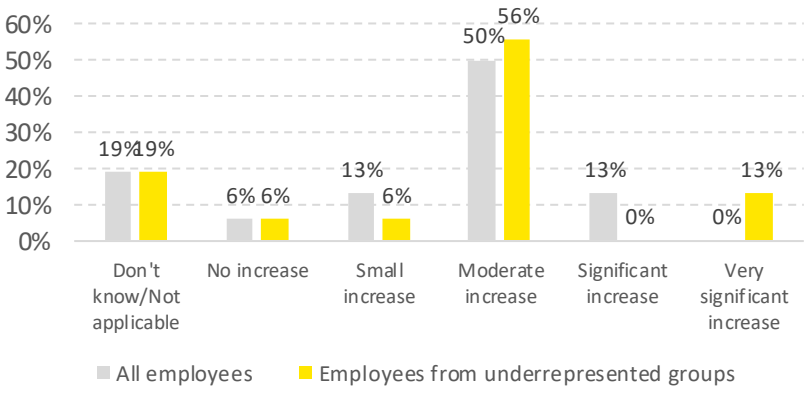
New Employment Opportunities

93% of the OSC's projects expect job creation to be one of the benefits of their work.

67% of jobs created will be filled by Highly Qualified Personnel.

The OSC's projects also create opportunities for existing workers to receive training and/or upskilling that they may not have received otherwise.

Q: To what extent has your organization provided increased training or upskilling opportunities for the following groups as a result of its participation in an ISI-funded project?[6]



Social Capital

The OSC enables pan-Canadian collaboration through its funded projects. The OSC also creates social capital by funding projects that generate community benefits. 94% of organizations reported additional ecosystem development interactions annually as a result of OSC activities, and 88% of these organizations expect to sustain the partnerships.

Q: Which types of organizations have you created partnerships with as a result of participation in an ISI-funded project?[7]

50% **For-profit firm in the same sector**

44% **Academic or Research institute**

44% **For-profit firm in a different sector**

Sources: 5 Web Survey, August – September 2021 6 Web Survey, August – September 2021 7 Web Survey, August – September 2021