



Treasury Board of Canada
Secrétariat

Secrétariat du Conseil du Trésor
du Canada

FOUNDATIONS

THE FIRST ANNUAL REPORT OF THE CENTRAL PERFORMANCE AND IMPACT ASSESSMENT UNIT

| 2019-2020

Canada



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Published by Treasury Board of Canada, Secrétariat
90 Elgin, Ottawa, Ontario, K1A 0R5, Canada

Catalogue Number: BT1-59E-PDF
ISBN: 2816-4105

This document is available on the Government of Canada website, Canada.ca

This document is available in alternative formats upon request.

Aussi offert en français sous le titre : Premier Rapport Annuel de L'unité Centrale D'évaluation du
Rendement et de L'impact



Foreword

Budget 2018 provided joint funding to the Treasury Board of Canada Secretariat (TBS) and Statistics Canada with the intent to place evidence at the centre of program design and delivery. As a result, the Central Performance and Impact Assessment Unit (CPIAU) was created to convene federal and international expertise in economic research and analysis, performance measurement, evaluation and policy. It seeks to provide evidence-based advice on business innovation programming and policy. This first annual report presents the unit's foundational work.


The CPIAU has studied how data interacts with policy as well as considering the implications for federal impact assessment practitioners. Indeed, defining a 'program' can be challenging yet is fundamental to leveraging the data required in conducting impact assessments. Through diligent review of program evaluations relating to business innovation and growth support programs, it has become clear that evaluation and performance measurement functions often struggle to fully articulate program impacts and collect the required data.

Additionally, the CPIAU has learned that program design is highly varied across government, which affords departmental flexibility to adapt to and address the

needs of Canadians. Though useful, this complexity permeates government and has resulted in great variation in funding and service strategies, resourcing and reporting practices. A long term CPIAU objective is to identify common horizontal indicators to better understand the driving forces behind program design and delivery.

With the identification of core variables that can be carried through data originating from 19 partner federal organizations, the CPIAU is continuing to extend the administrative data frontier and has begun experimenting with the unstructured data found in departmental performance reporting documentation. Specifically, the unit is now leveraging performance measures identified in Performance Information Profiles to better understand underlying program theory as well as resourcing information for various configurations of programs. The preliminary results of this work are presented here in this report.

It has been a milestone year. The CPIAU has completed a notional data model, held its first researchers' workshop to showcase and inspire work using shared central data assets, and co-developed new training for the evaluation and performance measurement communities with



The CPIAU has studied how data interacts with policy as well as considering the implications for federal impact assessment practitioners.

Statistics Canada on quantitative impact assessment. Our partners at Statistics Canada have released our dataset to the Canadian Centre for Data Development and Economic Research (CDER) and interested readers can now find preliminary high-level analysis of business innovation and growth support data available on the Agency's public website.

Looking forward, there are plans to build this common data asset in more efficient ways that reflect the Data Strategy Roadmap for the Federal Public Service. In turn, lessons learned from the past year could serve to transform the way we look at our programming across government. For example, the practice of using intermediaries to provide services and/or funding to businesses is common, but little data is captured on how long-term program objectives are met when this is the case. Further reflection is required to fully understand how the policy suite supports, or does not support, this program design. Additional guidance could better position the Government's data assets in this respect. Evidence-based decision making, after all, requires policy and guidance that produces evidence.

The CPIAU will also ask if the inherent complexity of our program design is always necessary, recognizing the limitations in results reported by small boutique programs. If a program has a small target population, we may not be able to release some data to the general public so that we protect the privacy – and potentially trade secrets – of the companies involved. This demands deeper reflection on the program design

and related performance measures and evaluation strategies required to adequately meet expectations for understanding impacts of government support in critical areas of the economy.

Lastly, I would like to thank the community of public servants who support this program. Our partners at Statistics Canada, Steering Committee members and data providers across government who lend time to this initiative to ensure its success. Our data providers contributed eleven years of administrative records to get us to where we are today and were among those who graciously rolled up their sleeves to get us to our first data releases.

I wish to invite you to reflect on the key findings presented in this report, and to engage us with your questions and comments. There is great value to be derived from the common data asset we are creating, and, we look forward to both your support and advice as we pursue new insights in the coming years.

Assistant Secretary, Expenditure Management Sector

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1.

Who We Are



Background

The CPIAU's mandate is to examine the impact of Business Innovation and Growth Support (BIGS) programing to help inform the government in investing in the right place, supporting high-performing businesses and meeting economic goals. In the long-term, the team will also undertake horizontal assessments of innovation programming on an ongoing basis using data developed in partnership with Statistics Canada (STC). The unit's products hold value to stakeholders and the broader evaluation and performance measurement communities and inform departmental policies, processes, program design, delivery and evaluation. Over time, data, research and analysis produced by the CPIAU will help to understand enterprise¹-level BIGS program associated economic benefits.

Governance and Partnerships

The CPIAU's success is grounded in the support it receives from its governance structure and partnerships. The CPIAU partners with Statistics Canada (STC) to collect and provide access to federal organizations and researchers to a central data asset through STC's Centre for Data Development and Economic Research (CDER). STC continuously supports the CPIAU's activities through data acquisitions, the continuous delivery of customized data tables and the design and development of processes for data integration including the Linkable File Environment (LFE). STC also disseminates data through *The Daily* publications. The CPIAU is further supported by an interdepartmental Steering Committee as well as 19 federal government organizations that provide data.

Interdepartmental Steering Committee

The CPIAU's Steering Committee (the Committee) informs and receives the CPIAU's findings and recommendations. The key objectives of the Committee are:

- Engaging in substantive discussion to provide advice, debate issues, and refine analysis;
- Providing departmental insight and advice on effective design, delivery, and evaluation of federal business innovation and growth support programs;
- Suggesting, developing, and validating topics for analysis and research;
- Meeting according to a schedule agreed-upon by the Committee; and,
- Receiving the CPIAU's annual report.

The Committee members include:

- Assistant Secretary, Expenditure Management Sector, Treasury Board Secretariat (Chair)
- Assistant Chief Statistician, Statistics Canada
- Assistant Deputy Minister, Finance Canada
- Assistant Deputy Minister, Innovation, Science and Economic Development
- Assistant Secretary, Privy Council Office
- Five senior representatives from other Departments/Agencies
- Senior representatives from the Regional Economic Development Agencies

¹ Enterprise includes non-profits and post secondary institutions, though the CPIAU is most interested in for profit firms. An enterprise comprises one or many firms. Enterprise refers to the highest level of the Business Register statistical hierarchy at Statistics Canada. In alignment with the System of National Accounts, it is defined as an institutional unit that directs and controls the allocation of resources relating to its operations, and for which financial statements are maintained from which international transactions, an international investment position and a financial position for the unit can be derived. Enterprises can be corporations, quasi-corporations, institutions, or unincorporated businesses such as sole proprietors or partnerships. For incorporated enterprises, financial statements can be consolidated. Source: [Statistics Canada: Definitions, data sources and methods: Statistical units](#)

■ The CPIAU plans to enhance collaboration with data providers and analysts at the working level via a new working group.

On the Horizon: CPIAU Working Group

In the next fiscal year, the CPIAU plans to enhance collaboration with data providers and analysts at the working level via a new working group. This group is expected to have wide representation to ensure a variety of perspectives are considered from departmental stakeholders involved in policy, performance measurement, evaluation and data. The group will meet to discuss, refine and validate evaluation and performance measurement methods, share knowledge, and assemble subject matter expertise to inform the development of data-driven products, policies and programs.



2.

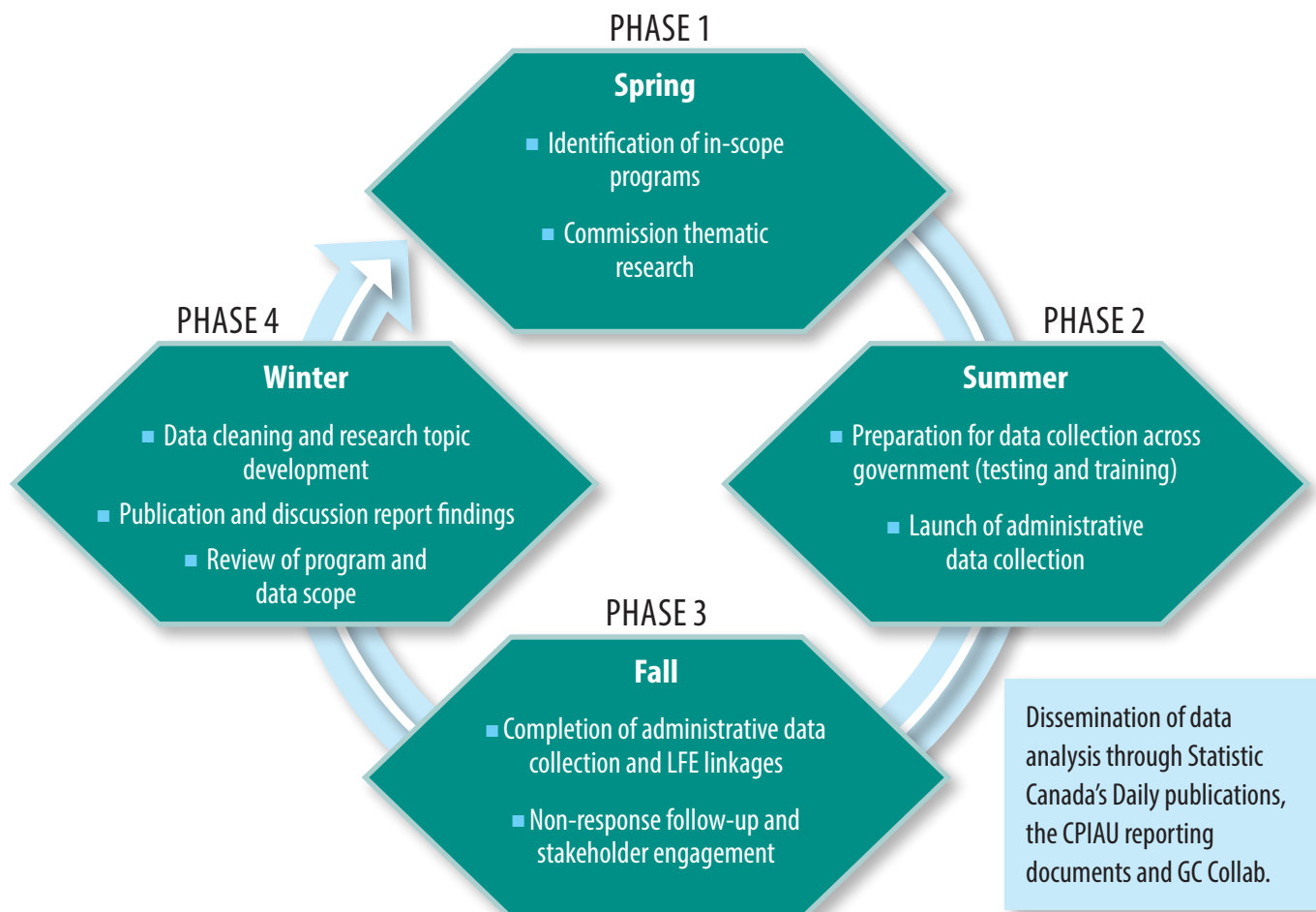
What We Do



In partnership with STC, the CPIAU is forging a path to collect, organize, link and analyze a central data asset on behalf of the Government of Canada. The activities and recommendations of the unit aim to assist the government to achieve innovation priorities, including the growth and global competitiveness of Canadian enterprises, measured through economic indicators such as revenues and employment. The work of the CPIAU focuses on providing evidence to support government spending oversight in tandem with central agencies.

The core of this work is the annual collection of Business Innovation and Growth Support (BIGS) administrative data, which contributes to the development of a longitudinal dataset used for statistical and econometric analysis of program beneficiaries, to inform perspectives regarding program performance. The CPIAU produces timely, high quality, and pertinent data and insights. Data collection is undertaken in four phases. The first creates the population base and essential characteristics of program streams² (the unit of observation) and is managed by the CPIAU. The second phase, managed

FIGURE 1 Annual Data Collection Cycle (as of 2019-20)



² Program stream is discussed in detail in later sections. Program stream is defined as a business-facing program of funding and or services that is distinctly distinguishable to its target audience by aspects such as name, purpose, and delivery model. (Source: the CPIAU Glossary)

by STC, gathers departmental administrative data on grants, contributions, services, and other interactions between enterprises (the unit of analysis) and program streams. In a third phase, STC links this data to enterprise-level records (the LFE) collected through STC surveys including detailed information of business value regarding employment, revenues, innovation and research.³ The fourth phase consists of data cleaning and analysis, report publication and discussion, and the identification of future research topics.

PHASE 1 – Program Information Forms 2017-18 and 2018-19

The Program Information Form (PIF) data collection exercise is relevant to the mandate of the CPIAU and STC's Centre for Special Business Projects (CSBP). Via the PIF, departmental program information is requested for programs identified as within CPIAU scope⁴ and any additional business support programs. Two PIF cycles have been completed⁵ since the inception of the CPIAU, with each cycle adjusted based on lessons learned from past work.⁶ The 2017-18 data collection exercise⁷ revealed the complexity of program reporting structures, highlighting financial system and program heterogeneity, data acquisition periods, departmental human resource capacities, inter/intradepartmental business relations, and the existence of intermediaries as funding/service program delivery mechanisms. In addition, the 2017-18 PIF exercise revealed that data quality varied amongst programs and was of higher quality for more recent programs.⁸ The information requested included:

- outcomes that programs pursue or expected to observe in/from beneficiaries;
- types of beneficiaries targeted for support by each program;
- identification of intermediaries, programs using intermediaries to distribute support and support types;
- quantity of information collected by each department about program beneficiaries and intermediaries.

The lessons learned from the 2017-18 round of data collection regarding data gaps and program architecture complexities provided the impetus for the development of the CPIAU data model and supported streamlining of PIFs for the next cycle. For example, for the 2018-19 cycle, the forms were adapted for clarity and to reduce administrative burden (2 forms replaced by 1) with fewer questions and better links to other data sources.

PHASE 2 – Administrative data collection

Administrative data collection produces a dataset of enterprises that received support through BIGS programming during the reference year. This data includes information on individual projects and related transactions, as well as key attributes of the support provided (e.g. funding or services, grants, repayable or non-repayable contributions). Initial data collection sought to create a large database to support analysis and includes longitudinal enterprise data from 2007 to 2017.

³ See Annex 1 for a full list of LFE surveys. See Annex 2 for terms of access to LFE data.

⁴ See Annex 4 for a list of BIGS eligible and non-eligible activities.

⁵ The 2019-20 data collection cycle is currently underway.

⁶ The PIF data collection exercise is an annual iterative process; learning from one round is incorporated into subsequent rounds (ex: streamlining forms, adjusting information requests, adjusting scope to include new programs).

⁷ There is a one-year lag in data collection, 2017-18 refers to the collection reference year, not the year in which collection was conducted. The 2017-18 data collection cycle was completed as part of the Horizontal Innovation and Clean Technology Review (HICTR) and collected data from 2007-08 to 2017-18.

⁸ STC citation November 2019.

Findings and recommendations may inform the development of future research topics.

PHASE 3 – Beneficiaries linked to program streams

Following the microdata collection and using the program structures established by the PIF, CSBP linked BIGS supported enterprises to the program streams that supported them. These links completed the structure from spending program to beneficiary⁹ enterprise, allowing enterprise-level data to be associated with program streams and departments. Looking ahead, the CPIAU will conduct annual data collection exercises using the PIF and microdata to add layers to existing datasets. The PIF will also be useful to map out the new spending program architecture as departments have transitioned from the Program Alignment Architecture, which previously linked the program universe¹⁰ to the Departmental Results Framework.¹¹

PHASE 4 – Data cleaning, report publication and research development

Upon official STC release of the BIGS microdata file and descriptive analysis of aggregate tables via *The Daily*, the CPIAU develops annual report findings and recommendations. Data dissemination takes place through CPIAU documents, GC Collab and via engagement activities with stakeholders. Findings and recommendations may inform the development of future research topics.

⁹ A beneficiary is an entity that derives direct tangible or intangible benefit from the activities of a program stream. Source: *Central Performance and Impact Assessment Unit*.

¹⁰ Throughout this document, the program universe refers to programs considered in-scope for BIGS. The program inventory (PI) refers to the entire population of government programs, of which BIGS programs are a sub-set.

¹¹ Program expenditures are currently available as per the Public Accounts of Canada via GC Infobase. The CPIAU seeks to obtain a deeper understanding of microdata at the project level than what is currently available on GC Infobase.



3.

Milestones:
2019-2020
Fiscal Year
in Review





APRIL: Launch of Program Information Form

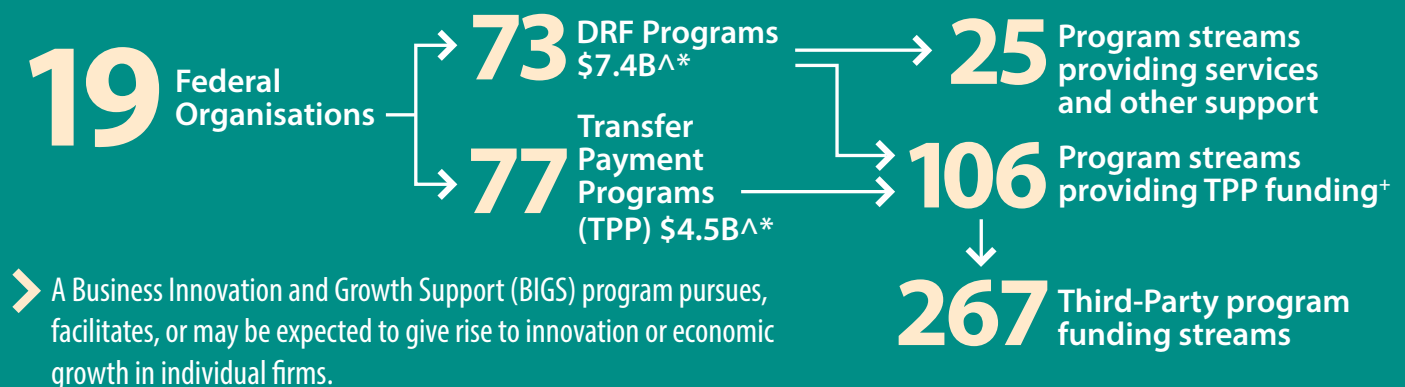
In April 2019, the CPIAU launched this year's Program Information Form (PIF). The exercise identifies the BIGS program universe for the coming year and is essential to execute subsequent STC data collection, as well as the eventual release of BIGS data tables through *The Daily*. The PIF exercise also provides key financial management variables. Training was delivered to Departments by the CPIAU to ensure a streamlined data collection approach and to confirm the 2018-19 PIF frame (the BIGS program universe).



JUNE: Launch of Online Community of Practice

Via GC Collab, the CPIAU launched an online Community of Practice as a platform for members to keep abreast of current and frontier approaches in impact assessment, data collection and indicator design employed across government. The community supports knowledge sharing and practical methods to incorporate data into departmental activities and is open to both public servants and academic researchers. The group reached 100 members in its first months.

FIGURE 2 Program Stream Inventory for 2018-19¹²



Not in scope:

- Crown corporations
- Funding to non-profit organizations for activities where no business is identifiable as a direct beneficiary
- BIGS Departmental Results Framework (DRF) Programs are a sub-set of the Program Inventory

*2018-19 planned spending, where reported

^ Includes expenses and activities that are not in scope in some cases

+ Does not include sub-streams

¹² These figures are based on the reports of federal organizations, since not all Transfer Payment Programs (TPPs) had reporting requirements (e.g. REGI), the PIF frame was reduced from 85 to 77. Departments only report on TPPs that are in their departmental plans. Service intermediaries are not included in these figures. The total number of intermediaries reported by organizations in 2018-19 was roughly 472.

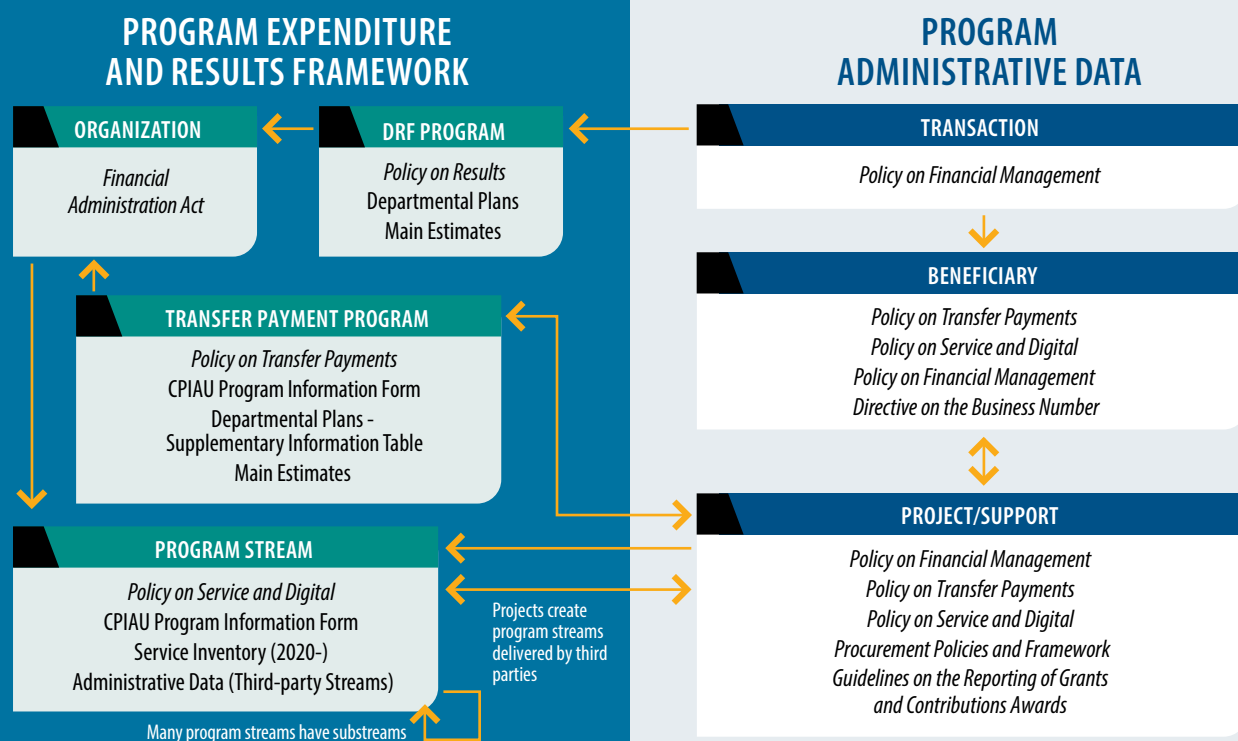


AUGUST: Creation of the CPIAU's Notional Data Model

To decipher and electronically capture the complexity of the program universe, the CPIAU developed a data model that describes BIGS program data as it relates to the policy suite¹³ and government activities involved in delivering and monitoring programs. This data model served as a first attempt to map the multi-directional pathways between expenditure entities and actual entities receiving support, whether financial or

otherwise, to eventually trace the flow of support to and from beneficiaries, enabling the capture and analysis of firm¹⁴-level outcomes. The data model dovetails with the current policy suite and attempts to lay the building blocks to uncover further data granularity, as is required to perform impact assessment as prescribed by [budget 2018](#).¹⁵

FIGURE 3 The Data Model



¹³ See Annex 3 for a list of BIGS relevant policies.

¹⁴ Aggregate firm data may be available in the future. Enterprises comprise firms, non-profits and post secondary institutions, though the CPIAU is most interested in firms (for profit enterprises). An enterprise comprises one or many firms. Source: Central Performance and Impact Assessment unit.

¹⁵ The CPIAU was created "To undertake innovation performance evaluations on an ongoing basis" and "to ensure business innovation programming is investing in the right place, supporting high-performing businesses and meeting economic objectives."



SEPTEMBER: Launch of Administrative Data Collection

Based on the frame developed through the Program Information Form (PIF), in September 2019, the Centre for Special Business Projects (CSBP) approached departments/organizations to request data on beneficiaries and intermediaries including names, addresses and business numbers, and related transactions, of all firms/organizations which received support through the identified program streams. The CSBP also requested information about the amount and type of support provided to each beneficiary. In support of this work, the CPIAU offered custom training to all responding Departments and developed in-depth guides and templates.

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NOVEMBER: Release of BIGS Data via STC (CDER)

In November, access to the BIGS program database was made available via STC's Centre for Data Development and Economic Research (CDER). This opened the new data asset to analysts across the public service and researchers in academia, which is expected to greatly enrich subject matter expertise as well as a common knowledge base as more perspectives and insights are applied to questions around BIGS programs.

Expanding the CPIAU Network – The CPIAU Research Workshop

Also, in November the CPIAU played host to Canadian and international academics and federal departments who attended the unit's first annual research workshop entitled, "Methods, techniques and tips for horizontal impact assessments." There were 128 participants, representing 19 Canadian federal departments and agencies as well as foreign governments ranging from the United States of America to Europe. Presentation topics ranged from evaluation methodologies to impact assessment techniques. The research workshop revealed that policy analysts, program managers, evaluators and academics shared a common pursuit and approaches in assessing the impacts of innovation and government innovation support programs. They noted that innovation occurs within ecosystems, that determining innovation causes and effects is challenging and that efforts should be directed towards measuring changes in capabilities and capacities of firms and ecosystems. Further, the assembled experts noted that the heterogeneity of Canada's suite of business innovation and growth support programs presents its own set of challenges for impact and performance measurement. They agreed that there is no one preferred methodology but rather that analysts should employ the best set of quantitative and qualitative approaches available when undertaking impact assessments.



JANUARY: **First release of BIGS data tables in Statistics Canada's Daily**

In January, Statistics Canada made the first [public release](#) of Business Innovation and Growth Support (BIGS) program data. The tables present analysis on programs from BIGS departments and agencies, showing annual totals of BIGS support for firms by employment size, revenue and industry.

MARCH: **Government of Canada API Store Proof of Concept**

In partnership with the Government of Canada's Application Programming Interfaces (API) Store and [Innovation Canada](#) at Innovation, Science and Economic Development Canada (ISED), the CPIAU sponsored a proof of concept exercise to demonstrate the potential for electronic data exchange across departments that would allow multiple users to access the data required by the CPIAU annually, at the discretion of data providers. It is further intended to dramatically reduce the administrative burden of supplying data through less automated means. The results of this exercise will be further discussed in the coming fiscal year.

Pilot Training for Evaluators and Performance Measurement Experts - Quantitative Impact Assessment (QIA)

The CPIAU and STC co-developed a pilot course for evaluators and performance measurement practitioners to enhance quantitative impact assessment (QIA) capacities, encourage departmental data uptake

and share analytical methods for evaluation and performance measurement. This may be of special interest to departments that identified data limitations as a challenge in previous evaluation reports. It is anticipated that the QIA course will be offered semi-annually.

The CPIAU developed a [glossary](#) for BIGS Programs between its first and second data collections. By September 2019, the glossary consisted of 70 terms relevant to the Unit's data and research activities. There were two purposes for creating the glossary. The first was to compile a set of definitions that would be applicable across all CPIAU outputs and relevant to all stakeholders, including program managers, performance measurement practitioners, evaluators and researchers. The second reason for creating the glossary was to more closely align the concepts used by CPIAU to existing concepts in Government of Canada (GoC) policies and directives. Developing the glossary involved gathering definitions from multiple sources, predominantly GoC policies and directives,¹⁶ but also international statistical manuals¹⁷ and products that CPIAU developed for its first data collection in 2018.

The glossary that was circulated for the 2019 administrative data collection represented a balance between creating precise definitions and maintaining consistency with the definitions that were used for previous data collections. As the unit's understanding of policies and departmental practices evolved, there was a strong desire to refine the definitions in the glossary to better reflect a nuanced reality. However, the unit also recognized the importance of keeping definitions consistent over time, especially as they pertain to data that will be collected annually. Going forward, the CPIAU intends to continue adding terms to the glossary while making minimal edits to terms that are already included.

The CPIAU created an English and French version of the glossary and each definition is explained in both official languages to facilitate cross-reference.

¹⁶ See Annex 3 for a list of directives.

¹⁷ See Annex 3 for a list of international manuals.

4.

Identifying Data Cornerstones in a Complex Program Universe



Programs, Program Streams and Services

CPIAU data collection reveals that for BIGS programs, federal departments and agencies organize programming according to two structures: one that is used for reporting (the DRF program) and another that is public facing (the program stream). Departments have expected results for each program with indicators that allow for the measurement of achieved results; however, the Canadian public often does not interact with BIGS programs. The 2017 Horizontal Innovation and Clean Technology Review developed the term “Program stream” to describe the identifiable, branded, public-facing entity with which businesses and organizations interact when seeking support from the federal government. This was necessary in order to enable the collection of microdata (e.g. projects, firms, transactions) and to obtain more granular expenditure data than what is currently available through the Public Accounts of Canada (GC Infobase). According to the Policy on Service, a service is defined as the provision of a specific final output that addresses one or more needs of an intended beneficiary and contributes to the achievement of an outcome.

The Business Innovation and Growth Support (BIGS) program universe is highly diverse and reflective of the flexibility the policy suite affords. For example, both Transfer Payment Programs¹⁸ (TPP-defined by the *Policy on Transfer Payments*) and Departmental Results Framework¹⁹ Programs (DRF-defined by the *Policy on Results*) can contain multiple individual programs. A Transfer Payment Program might fund multiple DRF Programs while a DRF Program may be funded by multiple Transfer Payment Programs. Further, a single DRF Program may house a service program, a contribution program and a policy centre of excellence, each with common themes and expertise, but distinct mandates (see Figures 4, 5, 6 and 7 for visual examples to illustrate program complexity).

This program architecture has created challenges with respect to reporting on program performance within the Business Innovation and Growth Support (BIGS) program suite – evidence-based policy design requires policy that produces evidence. A deeper study of these complexities

will be undertaken in the upcoming fiscal year to explore the extent to which DRF programs in the BIGS program suite channel funding to certain activities.

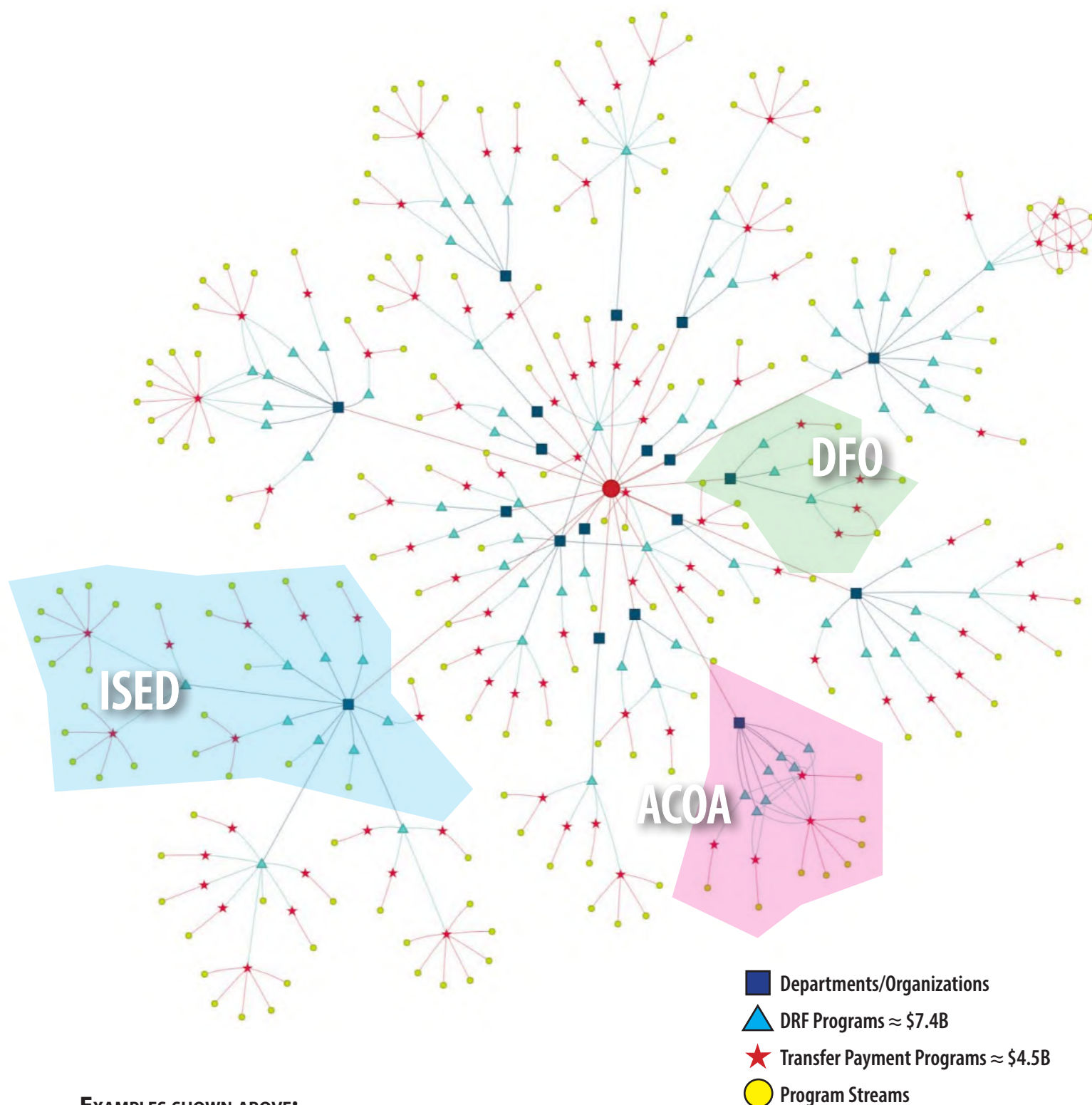
The notional data model created by the CPIAU, presented in Figure 3, captures the interaction of the BIGS program suite in this respect. Additionally, the policy suite shifts over time, as it did with the introduction of the *Policy on Results* in July 2016, when both the lexicon and reporting structure shifted across government and, in turn, impacted government administrative data.

In order to create a common unit of analysis, the Horizontal Innovation and Clean Technology Review (HICTR) introduced the concept of the program stream, breaking the policy suite down to the lowest possible common denominator. To collect microdata, it is necessary to separate the administrative unit (DRF Program) from the actual initiative (the program stream) put in place to fulfill the policy objective. The names may be the same in some cases (e.g. Innovation

¹⁸ A transfer payment program is defined as: a program or a component of a program supported by transfer payments. (Source: [Policy on Transfer Payments](#))

¹⁹ In this report a DRF program is a BIGS program and refers to a subset of program inventory programs. A DRF program is defined as: individual or groups of services, activities or combinations thereof that are managed together within the department or agency and focus on a specific set of outputs, outcomes or service levels. Programs are identified in a department's or agency's program inventory (per the Departmental Results Framework). (Reference: [Policy on Results](#))

FIGURE 4 Unraveling Program Stream Complexity from 2018–19 BIGS Inventory



EXAMPLES SHOWN ABOVE:

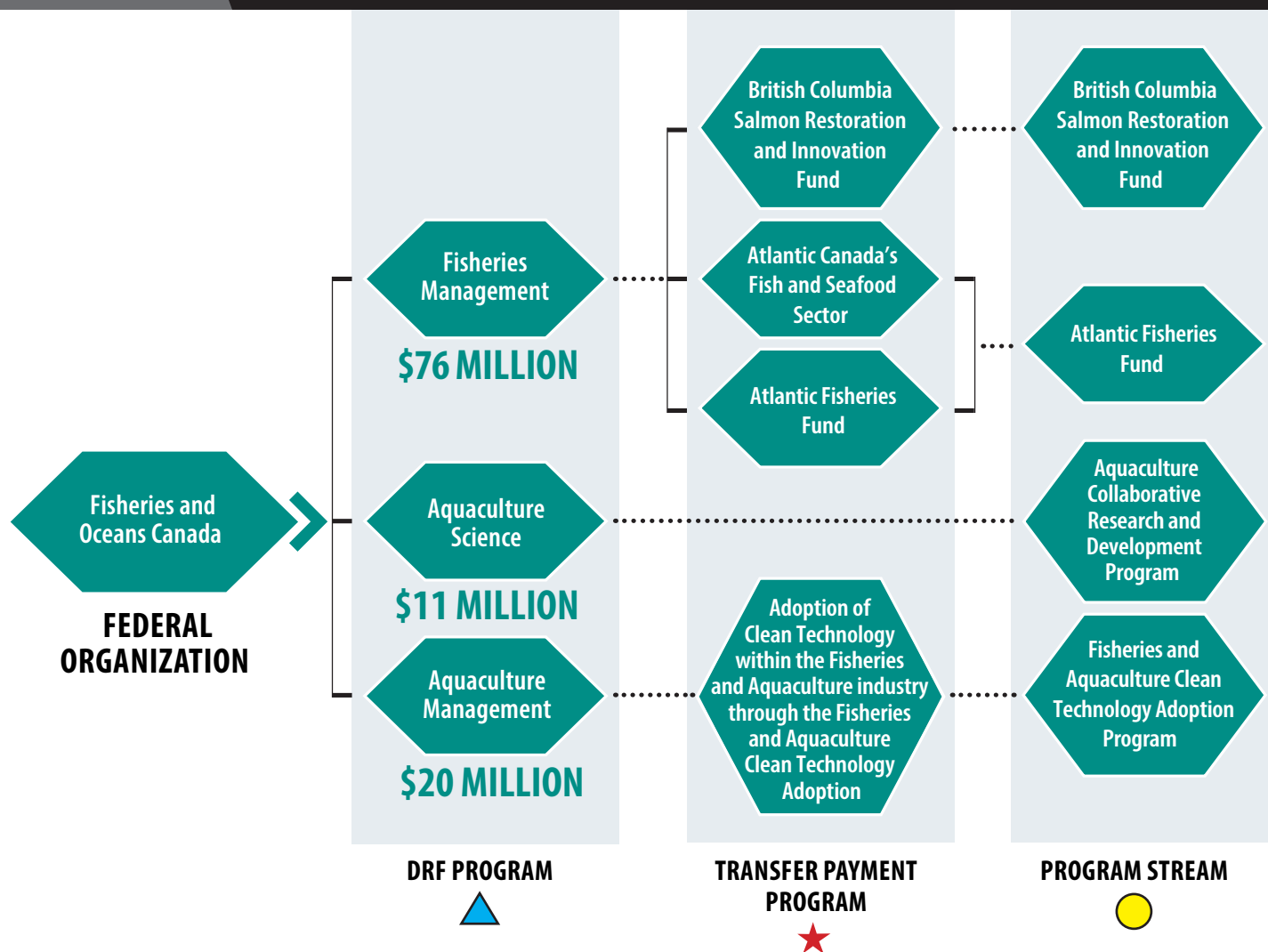
Fisheries and Oceans Canada (DFO)
 Atlantic Canada Opportunities Agency (ACOA) and
 Innovation, Science and Economic Development Canada (ISED)

Superclusters). A program stream is the entity that faces the public²⁰ and that is announced by parliamentarians. Any citizen should be able to find a program stream using a basic Internet search. The program stream definition complements the *Policy on Service and Digital's* definition of a service. Efficiency analysis requires granular financial data that is not readily available across government currently. The lack of data at this level can be problematic for the evaluation

and performance measurement communities as well, making efficiency and economy associated with specific initiatives difficult to ascertain.²¹

The CPIAU employs program streams as the focal point for impact assessment. The unit is focused on the impacts that federal programming has on firms and other beneficiaries (non-profits and post-secondary institutions). Program streams serve as the direct link

FIGURE 5 Fisheries and Oceans Canada, 2018-19 Programs and Program Streams



²⁰ For example, the Temporary Foreign Workers DRF Program at Employment and Social development Canada is included in the CPIAU program stream inventory; however, businesses do not interface with this program. Instead, businesses recognize the Global Talent Stream program (which is part of the larger Temporary Foreign Worker initiative).

²¹ The Transfer Payment Policy clearly outlines the reporting requirements for contribution agreements from a financial management standpoint, however, reporting for impact assessment purposes is not clearly outlined. Thus, financial stewardship is emphasized as opposed to the impact of funding on beneficiary outcomes.

between departments and beneficiaries. Establishing this link can be particularly challenging in instances where a program stream is supported by more than one program.²² In cases where there is an application process involved for firms seeking to obtain government support, potential beneficiaries apply to program streams,²³ not DRF programs. Understanding how application processes function, and how applicants are selected to receive funding would facilitate impact assessment analysis. However, the availability of this data is not yet well understood.²⁴ This may be an area for future CPIAU research.

In total, the BIGS program inventory as of 2018-19 consists of programs from 19 departments, 77 transfer payment programs²⁵ and 73 Departmental Results Framework (DRF) programs. The overall interaction of these data points is graphically represented in Figure 4.

Understanding how application processes function, and how applicants are selected to receive funding would facilitate impact assessment analysis.

EXAMPLES: Fisheries and Oceans Canada, Atlantic Canada Opportunities Agency and Innovation, Science and Economic Development Canada

In order to describe the unique complexity of Business Innovation and Growth (BIGS) support programming, it is useful to consider some practical examples, based on the CPIAU's data collection experience to date. The BIGS program universe is displayed graphically in Figure 4. Figure 5 describes the BIGS program structure for the Department of Fisheries and Oceans Canada (DFO), which has three Departmental Results Framework (DRF) programs that support businesses:²⁶ Aquaculture Science, Aquaculture Management and Fisheries Management. According to the Public Accounts of Canada (as reported in GC Infobase), 2018-19 expenditures for DFO BIGS programs totalled \$107M.²⁷ When firms receive support from DFO they do not interact with the DRF program, but with one of four program streams: The Aquaculture Collaborative Research and Development Program, the Fisheries and Aquaculture Clean Technology Adoption Program, the Atlantic Fisheries Fund, or the British Columbia Salmon Restoration and Innovation Fund. DFO measures results and performance at the DRF program level. Adding a layer of complexity, program streams are often associated with Transfer Payment Programs (TPPs) which may have identical or different names as the program stream. The DFO example applies to all 19 BIGS federal organizations. Figures 5, 6 and 7 provide a visual representation of the program architecture from the CPIAU's perspective, with relative expenditure amounts for 2018-19.²⁸

22 For example, applications received by the Business-led Network Centres of Excellence are funded through at least two of three granting agencies which means that more than one department can be linked to a program stream through its PI Program (DRF Program). There are many cases where a Program Stream is linked to more than one PI Program (e.g. ACOA).

23 Program Streams are linked to DRF Programs.

24 The CPIAU recognizes that Performance Information Profiles (PIPs) identify relevant program performance measures. In addition to PIPs, other measures will be considered to attempt to produce more statistically reliable measures of impact using microdata (e.g. beneficiaries, projects, transactions).

25 This refers to the TPPs as reported by departments in 2018-19.

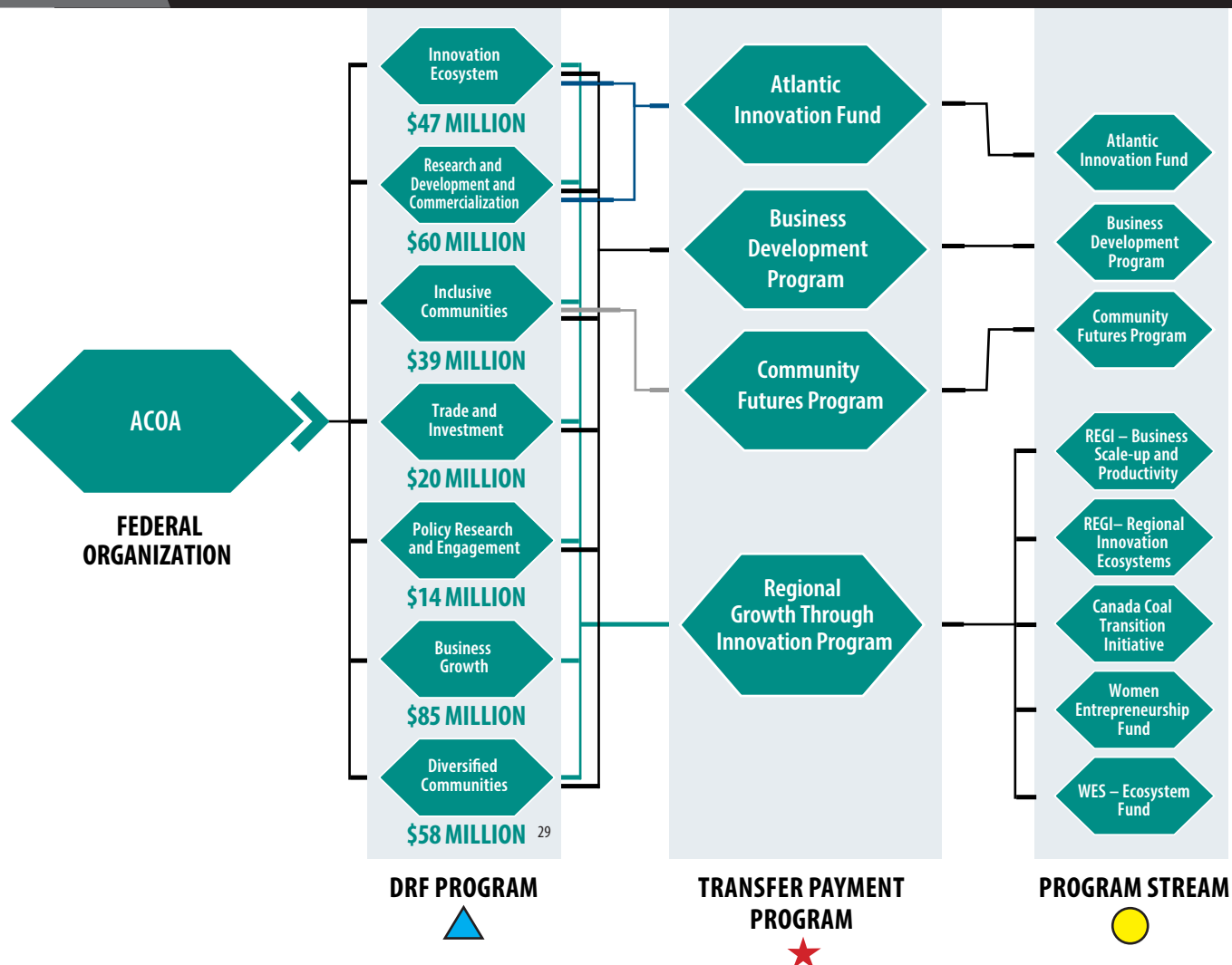
26 These are only the DFO programs that support businesses. The department has a much larger suite of programs.

27 See Annex 12 for current and planned spending figures for each BIGS DRF program for DFO, ACOA and ISED based on Public Accounts of Canada data published on GC InfoBase (see [Spending by Program](#)).

28 DFO, ACOA and ISED are chosen to demonstrate program architecture of varying complexity. These figures are based on 2018-19 data and so may include programs that do not exist at the time of report publication. Expenditure figures are based on public accounts data published in GC InfoBase.

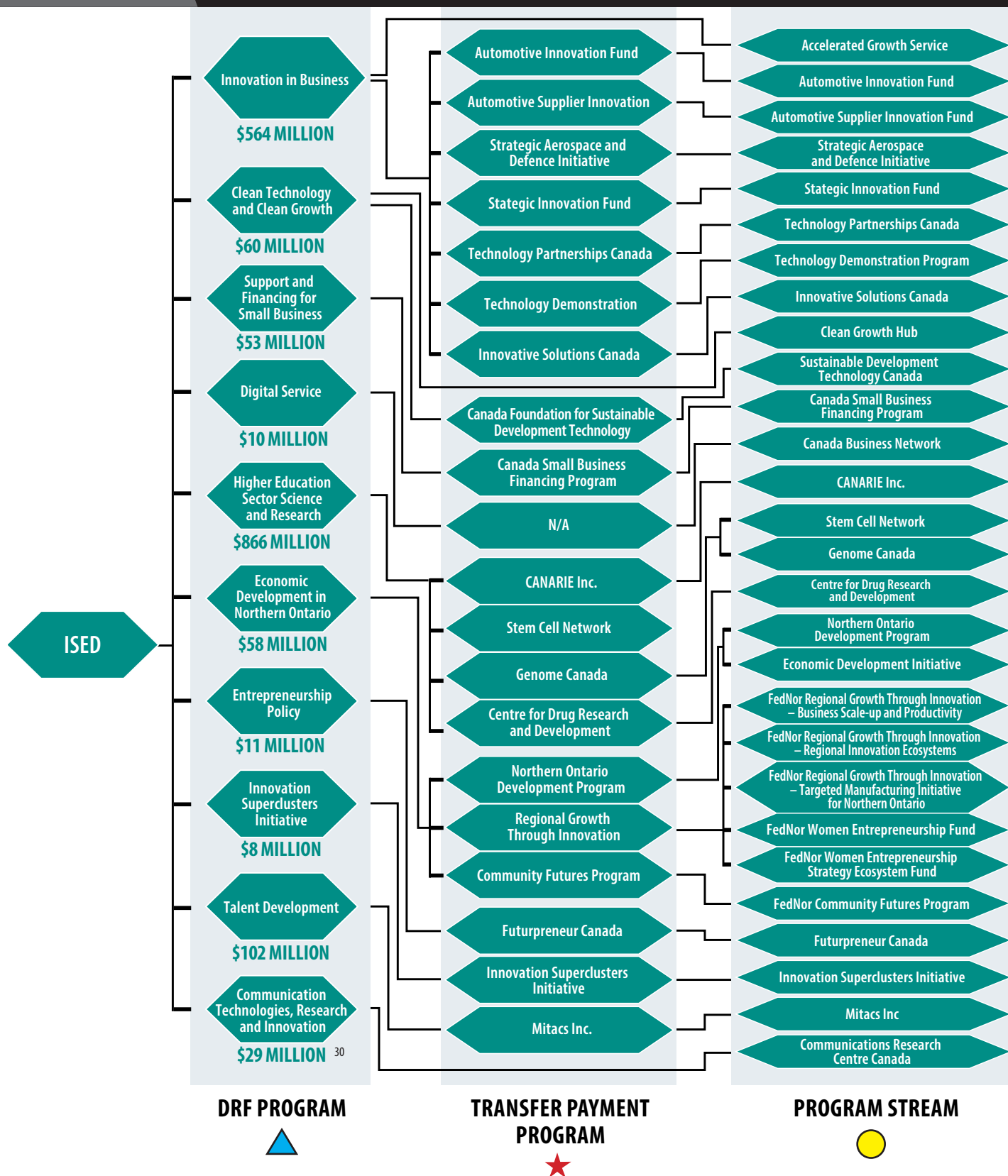


FIGURE 6 Atlantic Canada Opportunities Agency, 2018-19 Programs and Program Streams



²⁹ This figure refers to BIGS programs only.

FIGURE 7 Innovation, Science and Economic Development Canada, 2018-19 Programs and Program Streams



³⁰ This figure refers to BIGS programs only.

5.

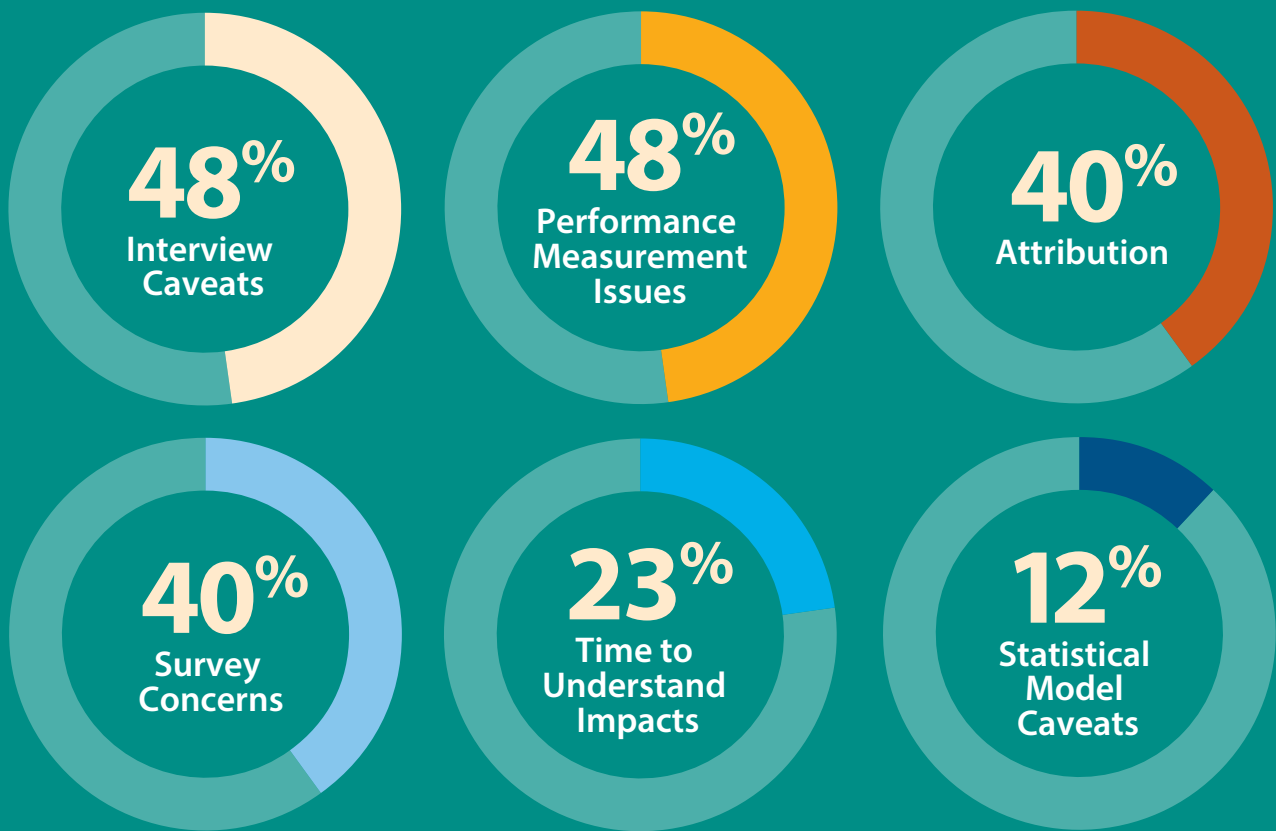
Leveraging
Existing
Knowledge to
Better Support
Evaluation and
Performance
Measurement



Evaluation and performance measurement demand a breadth of capacities and tools to conceptualize and attribute specific results to complex programs. Both fields offer a substantial knowledge base regarding planned program outcomes, which enables departments to develop Performance Information Profiles (PIPs), evaluation reports and Departmental Results Frameworks. These documents lend insights to the identification of statistical characteristic variables present in the BIGS program universe which, in turn, supports the CPIAU's pursuit of potential firm-level statistical tests that may be executed to assess program impacts.

To harness available evaluation and performance measurement information and contribute to the ongoing discussion, the CPIAU undertook to synthesize forty-eight BIGS program evaluation reports³¹ and identified common challenges including evaluation methodologies, impact attribution, performance indicators, data gaps and outcome measurement. The CPIAU then analyzed 997 unique program indicators found across the 19 BIGS Departments and 131 program streams. The results provide key insights on where impact assessment could serve to support evaluation, and how performance measurement could serve to support impact assessment.

FIGURE 8 **Current Practices: Evaluation Methodology Limitations and Challenges**



³¹ Evaluations were selected based on the following criteria: published online in 2012 or more recently, conducted for a Government of Canada department represented on the CPIAU Steering Committee, programs identified as in scope from the CPIAU's 2018-19 PIF data collection exercise.

Forward Vision: Enhancing Indicator Design for BIGS Programs

BIGS programs use a range of indicators to assess program performance. Often these indicators are conceptually comparable but measured and defined differently. For example, revenue and R&D are measured differently across departments/organizations:

Firm Revenue

- Revenue increase generated as a result of a project
- Millions of dollars in total new revenue acquired
- Revenues of Loan Client Businesses
- Dollar sales tied to knowledge-based product, process, service, or technology commercialized

R&D

- Forest Sector R&D Capacity
- Increase in R&D Personnel
- Increased R&D by Local Industry
- Increased Canadian Industry Investment in R&D

EVALUATOR PERSPECTIVES: Self-Reported Limitations and Challenges

All evaluations assessed program effectiveness through triangulation³² to corroborate findings and recommendations and to combine the strengths of various methodologies. Most evaluations contained a section on limitations.³³ Roughly forty percent of evaluations highlighted the difficulties of attributing impacts to specific programs. Several evaluations noted that target beneficiaries (firms) received funding from multiple partners, thus making it difficult to isolate program associated impacts on individual firms. In addition, counterfactual data; a key component of impact assessment,³⁴ was generally unavailable, which rendered the estimation of program attributed benefits challenging.³⁵ Approximately one-half (48%) of evaluations noted performance measurement (PM) issues as a limitation whereas two-thirds (67%) of

evaluations included at least one recommendation related to improving PM. Proposed PM improvements included: identification of indicators and data sources and advancing analytical methods and establishing databases – all elements of the work now jointly underway between the CPIAU and STC. The most commonly cited challenge was data gaps, reported in just over half (56%) of evaluations.

In many cases, the assessment of progress made towards the achievement of performance indicators³⁶ was incomplete. In some cases, client information was missing and/or data was untimely, limiting the potential for analysis. Some evaluations reported reasons for data gaps; for example, it was noted that collecting and recording outcome information was not always considered a top priority. Issues related to coding administrative data were another reason. In some cases, project beneficiaries may have self-reported data while others had not, resulting in variable data quality.

³² Using multiple lines of evidence to support the development of findings and/or recommendations.

³³ Figure 8 highlights the most frequently cited limitations in evaluation reports.

³⁴ Information on the outcomes (ex. profits, employment, survival) of beneficiary firms compared to non beneficiary firms with similar characteristics (the counterfactual population) is generally unobservable/unavailable.

³⁵ Exploration of methods to surmount the counterfactual problem through research are currently under exploration by the CPIAU (see research section below), in partnership with academia and performance measurement communities.

³⁶ The outputs and outcomes used to measure program performance.

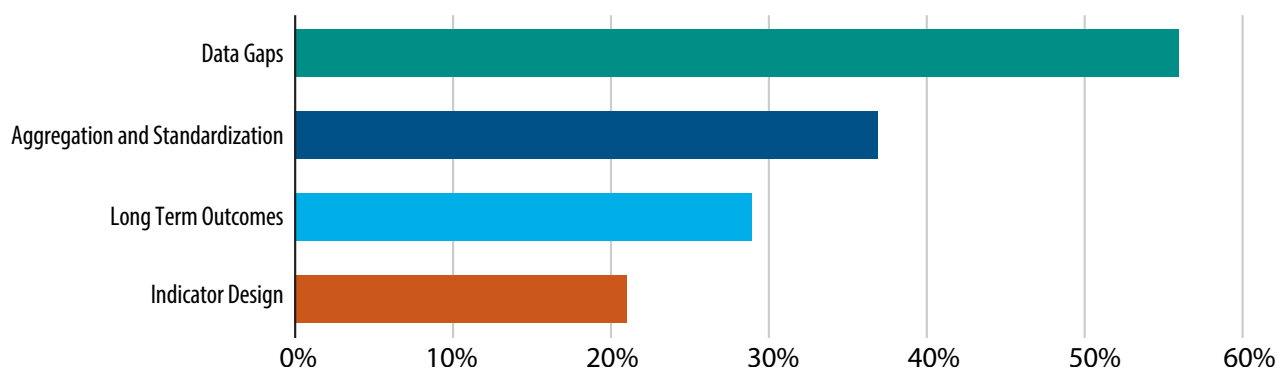
Just over one-third (37%) of evaluations noted challenges in the aggregation or standardization³⁷ of data. Data aggregation was a challenge for some programs because information was collected in different formats (e.g. multiple electronic locations versus paper files). Some programs noted database integration or quality issues; for example, the functionality in different databases may not exist to roll up quarterly reports to annual totals. This was particularly challenging for departments that delivered programs through intermediaries.³⁸ Better integration of department-intermediary data collection systems was noted as an area for improvement for these programs.

Additionally, evaluators noted particular challenges when self-reporting results, using unique methodologies for calculating figures and/or differing assumptions in interpreting and categorizing impacts. This may have been in part due to a lack of standardized forms and/or guidance. As a result, figures generated may have been of varying quality. It was suggested that, to ensure data is effectively aggregated and standardized, programs

could ensure that performance reporting information be undertaken using comparable performance documents with similar reporting processes and formats.

Twenty nine percent of evaluations noted that programs had difficulty measuring long-term outcomes. Many programs included increased firm revenues, productivity, R&D³⁹ and/or employment growth as intermediate outcomes; however, the benefits associated with innovation funding often require substantial time to be realized. In some cases, the commercialization benefits associated with innovation can only reasonably be measured five or more years after technology demonstration has occurred. For most programs, this goes beyond the post-project tracking activities of the program (many impacts do not occur until the project is complete).⁴⁰ Few evaluations proposed solutions to these issues though did acknowledge that existing performance measurement systems do not sufficiently capture how programs progress towards meeting long-term outcomes.

FIGURE 9 Performance Measurement Challenges



³⁷ Data aggregation refers to the process by which data is gathered and placed into a common repository. Data standardization is the process of bringing disparate data into a common format, which ensures consistency and compatibility. Standardization generally supports aggregation.

³⁸ An intermediary, also known as a third-party, is a beneficiary that is funded to deliver a third-party delivery program stream. Service intermediaries deliver non-financial support to clients. For BIGS programs, the clients of a third-party delivery service program stream include individual firms. See BIGS Programs: Impacts of Funding to Intermediaries section.

³⁹ For example, in the evaluation of NRC's Forest Sector Innovation subprogram, the evaluation logic model noted that forest sector R&D capacity is aligned with industry priorities as an immediate outcome of the program. However, the evaluation does not include an indicator that captures this outcome. This is a common finding in the evaluation synthesis: indicators used as reference points to assess program performance are often not included in evaluation reports. It may be possible for this program to use administrative data mapped to the LFE to estimate the firm level impacts on R&D associated with receiving support. In the absence of an indicator or knowledge of the industry priorities, it is difficult to ascertain progress towards this immediate outcome.

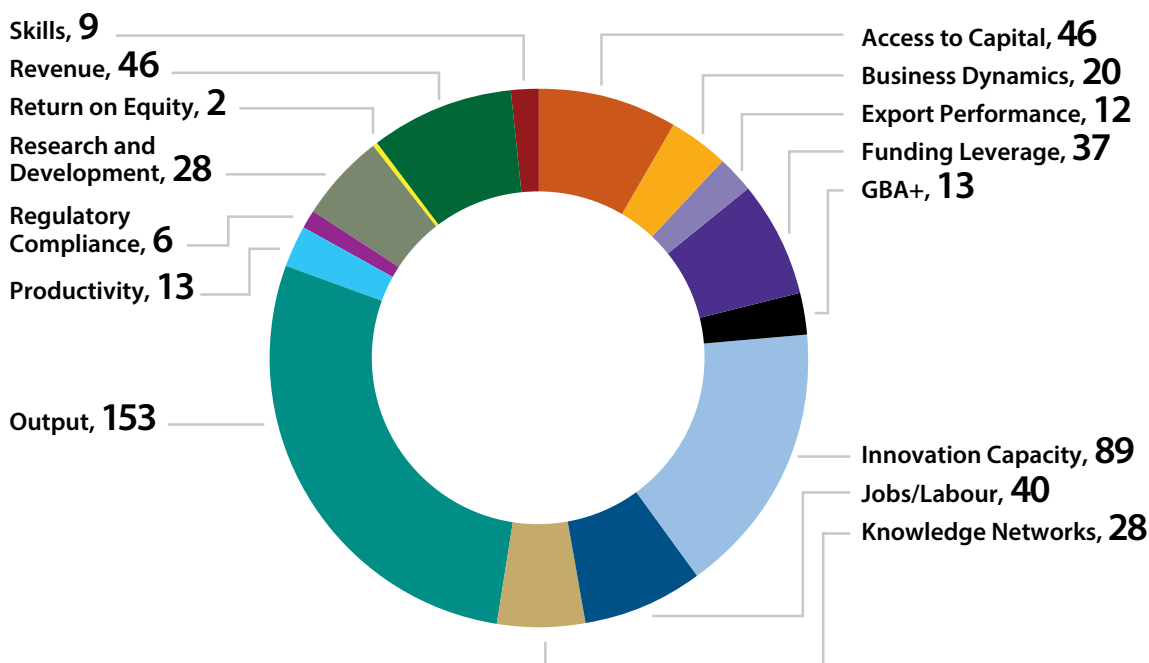
⁴⁰ As noted in ISED'S Sustainable Development Technology Fund and NRC's forest sector evaluations.

PERFORMANCE MEASUREMENT: Common Ground

A wide range of indicators is used in evaluations to measure the same outcomes. For example, various approaches were used by programs to measure program participation impacts on firm revenues and R&D. Twenty one percent of evaluations noted issues with respect to indicator design including ensuring performance indicators were valid and reliable with clear, common definitions. In these cases, evaluations noted that indicators needed to better measure the success of the program and more accurately capture program impacts. In addition, it was noted that indicators should be useful for program stakeholders when reporting on program results.

As already noted, the CPIAU reviewed the Departmental Results Frameworks (DRFs) and Performance Information Profiles (PIPs) of BIGS programs and found them to be associated with 997 unique indicators,⁴¹ 542 of which were firm-related, across 19 departments, 131 program streams, 74 DRF programs and 85 transfer payment programs.⁴² In consideration of the outcomes measured by indicators and the results to which they refer, it was determined that indicators could be grouped by theme. In the future, the CPIAU will put forward common metrics for discussion, in an effort to collaborate with federal organizations to identify indicators to report on progress in achieving common program outcomes. Tax and survey data from Statistics Canada's Linkable File Environment may support the development of common indicators. Within existing reporting frameworks, fifteen indicator themes were identified,⁴³ with uneven distribution across all themes (see Figure 10).

FIGURE 10 Thematic BIGS Program Performance Indicators



⁴¹ 997 unique indicators connected to 74 DRF programs were observed in the 2018-19 PIPs analysis. 542/997 were firm related. Examples of non-firm related indicators included improved research rankings, regulatory/policy compliance indicators and trade commissioner service standards. The pie chart sums to 542.

⁴² 77 of which had reporting requirements.

⁴³ See Annex 5 for indicator theme descriptions and examples. See Annex 6 for examples of STC data sets that could be leveraged to develop horizontal indicators and to assess firm level impacts of funding to BIGS programs.

6.

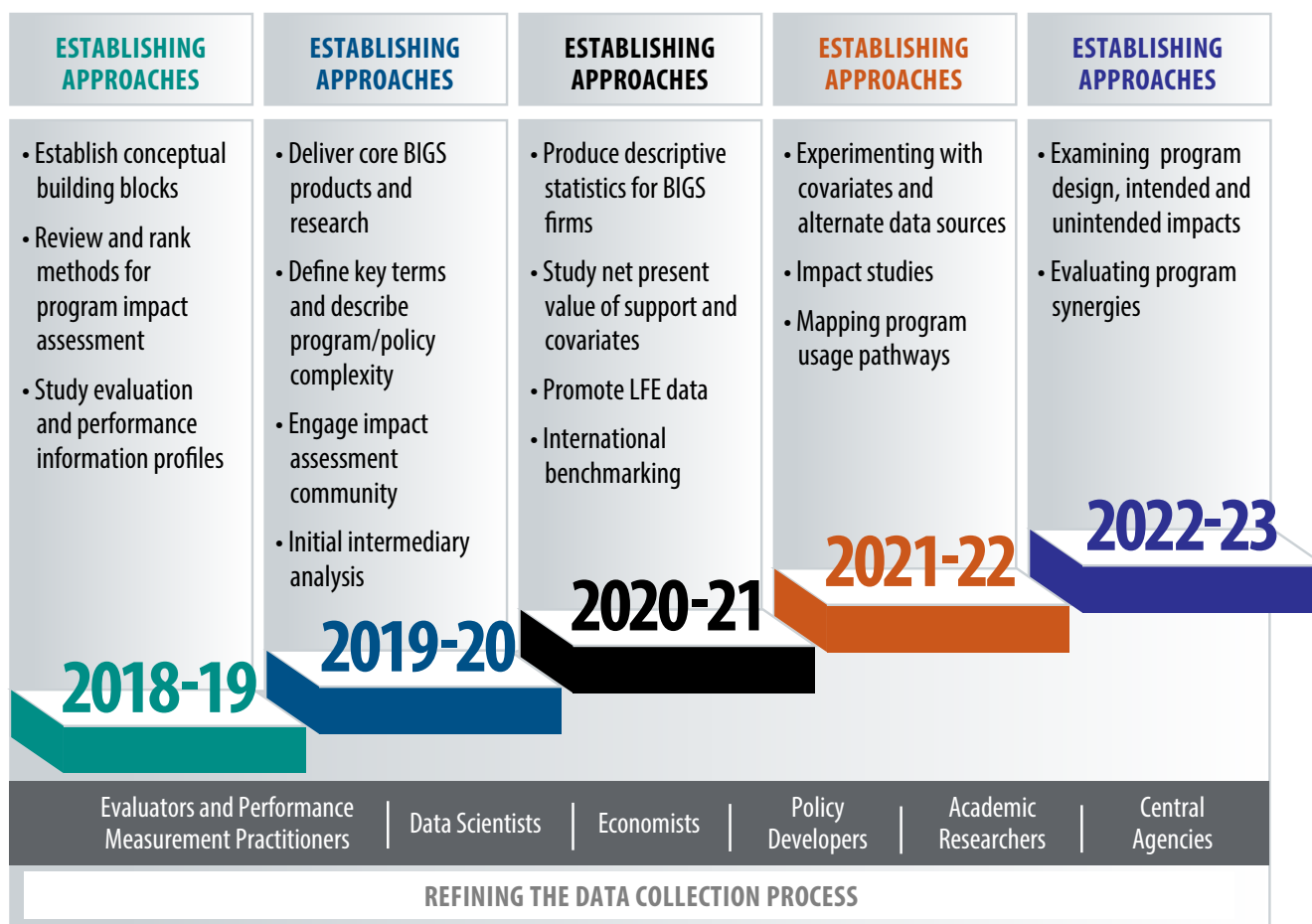
CPIAU Research: Commissioned Advice from the Experts



In 2018-19, the CPIAU commissioned academic studies to obtain guidance on impact assessment techniques and methods. Each study contributes to the CPIAU's mandate to improve the understanding and application of methods and techniques for impact assessment. Experimentation with data and research, as well as sharing results, is vital to the CPIAU's mission. To ensure that methods are rigorous, the team is exploring new approaches to performance measurement and evaluation. Key research priorities on Business Innovation and Growth Support (BIGS) program data are being identified in partnership with stakeholders from across the public, private, and academic sectors.

[Innovation Support Measures, Evaluation Approaches and Application Guidelines](#) and [Horizontal Innovation and Clean Technology Review – Assessment and Next Steps in Impact Assessment](#) (Jibril & Roper, 2019) Of these two reports, the first provides guidance on the appropriate impact assessment techniques to apply in consideration of diverse program beneficiary characteristics. Specifically, it identifies when it is possible and appropriate to use a randomized control trial or a quasi-experimental method,⁴⁴ and when the only available option is qualitative assessment. Program design features, assessment timing, heterogeneity of beneficiaries,

FIGURE 11 CPIAU Research and Data Agenda 2018-2023



⁴⁴ See Annex 5 for indicator theme descriptions and examples. See Annex 6 for examples of STC data sets that could be leveraged to develop horizontal indicators and to assess firm level impacts of funding to BIGS programs.

clustering opportunities, and consideration of rare populations are all factors identified in selecting the best assessment method. The report applies this methodology to 23 of the largest programs in the BIGS program suite and recommends one or more methods for assessing each program. Other BIGS programs are then ranked according to relative tenability for impact assessment using quasi-experimental methods. The second report provides a neutral review of the application of a pilot study using propensity score matching to assess BIGS program impacts, including recommendations for future research.

[Impact Assessment for Innovation Policy Programs in Canada](#) (De Fuentes, 2019) focuses on BIGS programs supporting clean technologies, global networks, high tech start-ups and university-industry collaboration. The study describes methodologies used by select Government of Canada programs in evaluation reports, identifies econometric models employed to evaluate the impact of innovation policies and identifies the variables frequently used (necessary) for impact assessment studies. The study also identifies the programs and granting offices which have been in operation for at least five years in the BIGS program suite. The study suggests focusing impact assessment efforts on programs which distribute grants since adjudication is competitive and peer reviewed, grants represent the most important type of support in terms of value for firms and finally, the need for data before and after the grant was awarded is necessary to perform dynamic analysis (available for grants).⁴⁵ The study identifies eleven innovation programs, as potential impact assessment candidates. Further, the study identifies best practices for impact assessment and the use of counterfactuals including data on “firms that applied for the policy program but were not successful.”⁴⁶

[Towards a Unified Framework for Evaluating Government Programs](#) (Plesca, 2019) and [Evaluating the Federal Government Support for Innovation and Clean Technology](#) (Plesca, 2019)

are two separate reports, the former begins with a literature review that describes the relationship between productivity and individual skills, training and education, and the role of government in building human capital. It then discusses the assessment methods that can be used to measure the effects of government programs that aim to improve human capital and highlights the need for high-quality data to enable the use of more advanced assessment methods. The latter report provides a detailed description of the suite of program streams included in the Horizontal Innovation Review, including ways that they may be grouped. It discusses methodologies for measuring the various outcomes that these programs aim to achieve, and how to evaluate a program's effects on both its beneficiary enterprises and the workers associated with those enterprises.

[An application of machine learning to identify nascent high-growth firms](#) (Macdonald and Houle, 2020) the CIPAU partnered with Statistics Canada's Economic Analysis Division to experiment with supervised machine learning to predict high growth firm populations. This study sought to answer the question: can machine learning and tax filing data be useful in predicting high growth firms⁴⁷ and found that for employment, the best performing machine learning model was the neural net, with overall accuracy for predicting both high-growth and non-high growth firms of 71%. For revenue, the study found that the best performing machine learning model was a randomized forest, with overall accuracy for predicting both high-growth and non-high growth firms of 70%.

⁴⁵ It has been noted that the evaluation of programs using grants is a challenge since recipients are not required to report to funding programs. From a CIPAU perspective, if a unique identifier for beneficiaries exists, linkages to STC administrative records would allow for impact assessment analysis.

⁴⁶ Comparisons should be made between program participants and non-participants with comparable technological capabilities.

⁴⁷ A high growth firms has:

- An average annual compound growth rate of at least 20% between 2012 and 2015

- At least 10 employees in 2015

Growth is considered in terms of employment and revenue.

7.

Key Attributes of the Program Suite



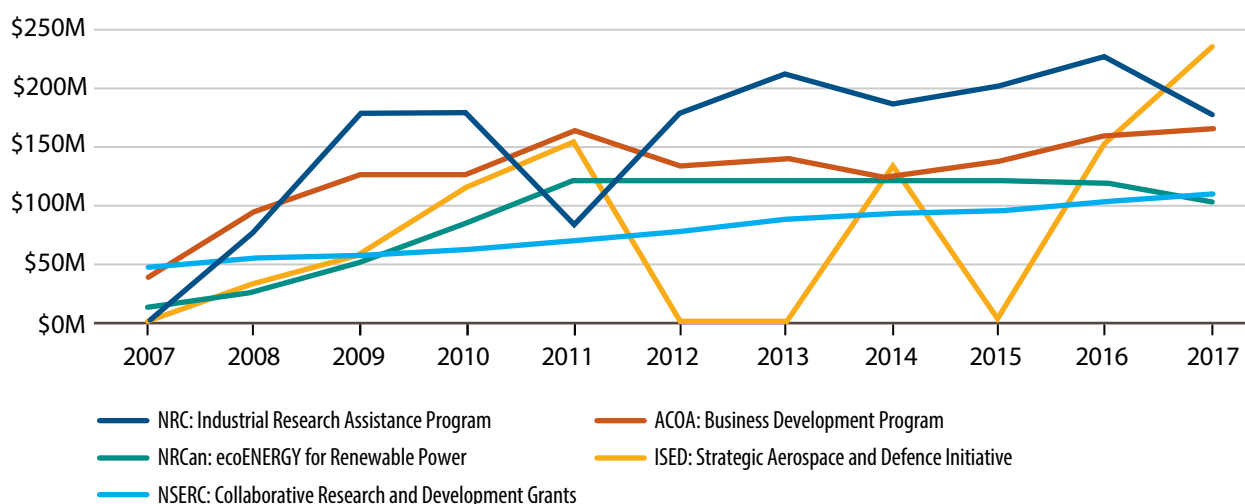
Program design has a significant impact on the Government's capacity to report on results. While all programs that collect the business number (BN) lend themselves to relatively robust data linkage with tax and other administrative data, individual identities of enterprises need to be safeguarded to maintain confidentiality and protect trade secrets. This means that when programs either target or serve a small number of beneficiaries, public reporting on the findings of this work can become impossible.

For small boutique-style programs, this is a key consideration during the design phase. In some cases, it may be that the business drivers behind the program dictate certain parameters while the level of risk the government takes on without means for long-term outcome tracking is acceptable. In others, this may not be the case. Either way, this is a matter that demands deep reflection as outcomes and related measures are set for new programming.

To demonstrate this, the Strategic Aerospace Defence Initiative (SADI) was one of the largest programs with respect to funding provided in the Business Innovation and Growth Support (BIGS) program suite. That said, it supported a relative handful of enterprises, concentrated in select industries. In order to retain confidentiality, indicators from Statistics Canada's Linkable File Environment (LFE), such as revenue growth and employment, cannot be publicly reported with the same level of transparency as larger programs with more beneficiaries.

While narrowly subscribed programs such as SADI are required in horizontal work to determine the overall performance of the BIGS program suite, reporting at the program level in evaluation is not possible. Thus, boutique programs require customized evaluation/performance measurement strategies that rely on primary data collection from beneficiaries over an extended period. Consideration in these circumstances should be given to administrative burden as well as ensuring that beneficiaries of government programming

FIGURE 12 Total Annual Value of Direct BIGS Support (All Enterprises)⁴⁸



⁴⁸ Source: STC tables produced for the CPIAU in 2019-20. For SADI, each \$0 value represents a year whereby data was not released by STC for confidentiality issues, thus implying a small amount of program beneficiaries.

fully understand their reporting requirements and are able to provide the data required to report on results at the time services are received or a contribution agreement is settled.

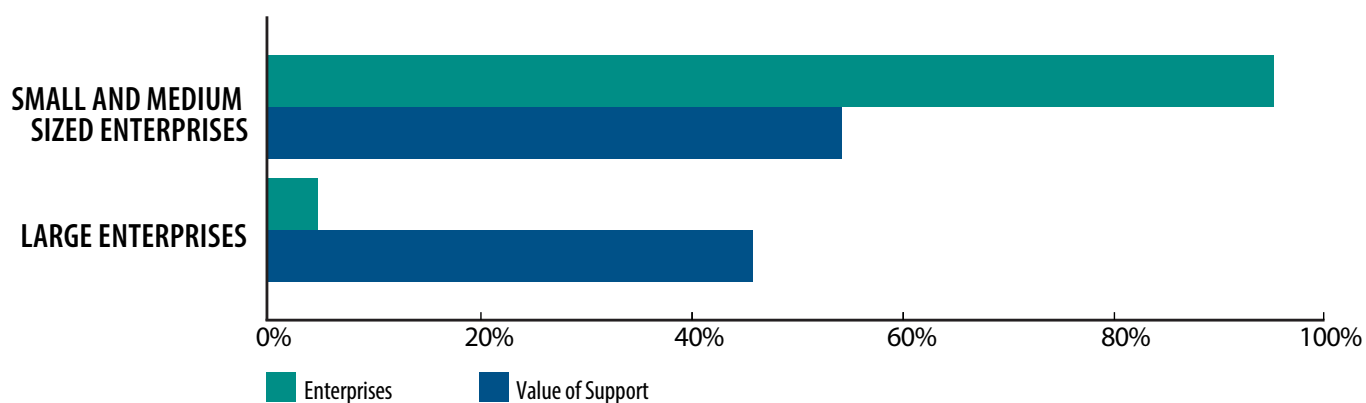
The CPIAU-STC central data asset comprises a longitudinal dimension, which allows for the estimation of enterprise outcomes associated with BIGS support for performance variables of interest. This rich data set represents an opportunity for impact assessment practitioners in the federal government and researchers to develop a new layer of analysis to inform BIGS program performance assessment. For example, for a predefined cohort of enterprises, it may be possible to use the central data asset to examine changes in employment trends for BIGS supported enterprises over time. Using this data, it may be possible to comment on the impact of federal funding on employment growth for enterprises in different industries. For example, for BIGS firms, employment grew from 440,557 in 2016 to 464,032 in 2018 (number of employees).⁴⁹

The majority of enterprises that received federal BIGS support were small and medium sized

Small- and medium-sized enterprises⁵⁰ accounted for 95% of the enterprises that received BIGS support through a federal program stream in 2017. Large enterprises, with 500 employees or more, accounted for 5% of enterprises that received federal support.⁵¹

Small- and medium-sized enterprises received 54% of the total value of federal government support in 2017. Enterprises with annual revenues of less than \$50,000,000 represented 92% of enterprises that received federal support in 2017, while those with annual revenues of \$50,000,000 or more accounted for 8% of enterprises that received support.

FIGURE 13a Total Annual Value of Direct BIGS Support (All Enterprises)



⁴⁹ Source: Statistics Canada, Centre for Special Business Projects (2020).

⁵⁰ Small enterprises are enterprises with fewer than 100 employees in a given year. Medium-sized enterprises employ between 100 and 499 employees annually, while large enterprises employ 500 or more employees in a given year. (Source: [The Daily](#))

⁵¹ As of December 2017, there were 1.18 million employer businesses in Canada (Table 1). Of these, 1.15 million (97.9 percent) were small businesses, 21,926 (1.9 percent) were medium-sized businesses and 2,939 (0.2 percent) were large businesses. (Source: https://www.ic.gc.ca/eic/site/061.nsf/eng/h_03090.html#point1)

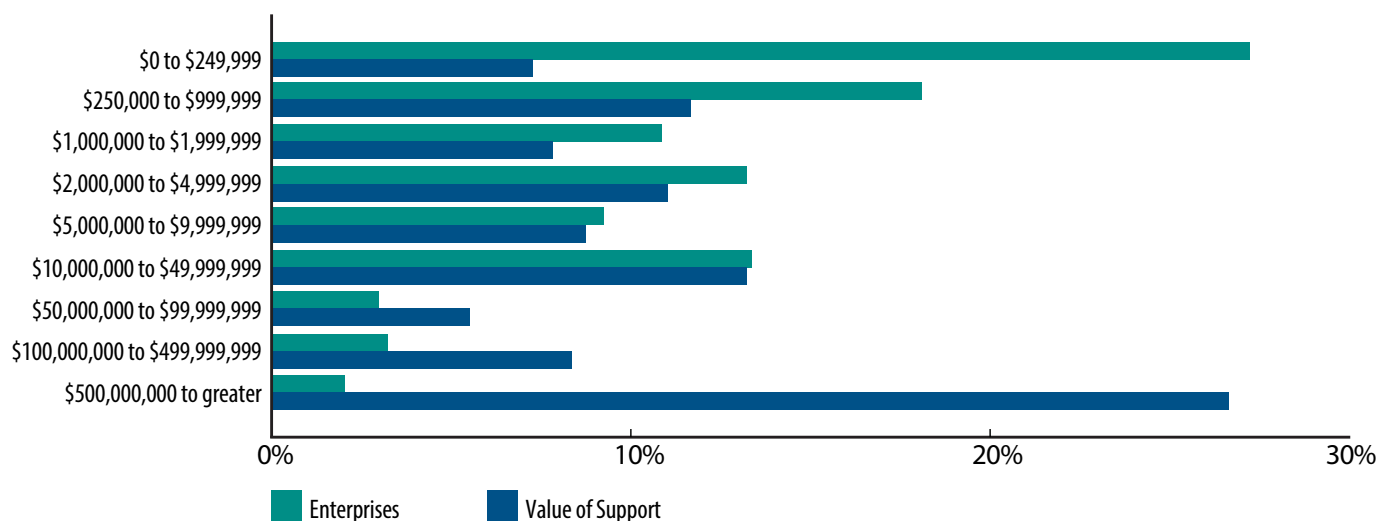
The average value of BIGS support per enterprise increased with enterprise size

In general, in 2017, the average value of BIGS support received per enterprise increased with the size of the enterprise. For example, the average value of support received by small enterprises was \$51,702 in 2017. Medium-sized enterprises received on average \$118,230 and large enterprises received \$956,954. The average value of support received by enterprises with annual revenues below \$250,000 in 2017 was \$20,235. Enterprises with annual revenues from \$5,000,000 to 9,999,999 received, on average, \$71,981 and enterprises with annual revenues of \$500,000,000 or more received \$1,017,373.

The manufacturing sector received almost one-third of the total value of BIGS support

The professional, scientific and technical services (29%) and manufacturing (24%) sectors accounted for the largest shares of enterprises that received BIGS support in 2017. In value terms, the manufacturing sector⁵² received almost one-third (32%) of the total value of support. By comparison, the professional, scientific and technical services sector, which accounted for the largest share of enterprises receiving support, received under one-fifth (16%) of the total value of support. The educational services⁵³ industry accounted for 3% of enterprises that received federal support. In contrast, in 2017, the value of support to enterprises in this industry represented more than one-fifth (21%) of the total amount of support.⁵⁴

FIGURE 13b Business Innovation and Growth Support by Revenue Size, % (2017)



⁵² Business innovation and growth support programs often target specific sectors or activities such as new market development initiatives including global value chains, research and development and internships. Manufacturers may be the targeted beneficiaries of programs or they may find the support offered to extend or expand business activities valuable. These tables allow analysis of distribution by industrial sectors of programs' ultimate beneficiaries. Data users are advised to employ caution when making cross-sector comparisons due to the nature of programs' selection or eligibility characteristics.

⁵³ Educational services: some federal BIGS programs encourage collaboration between post-secondary institutions and businesses on research and development projects and for student work terms, placements, internships and/or other forms of skills development. Some BIGS programs allow for utility companies to apply for support (e.g., the Smart Grid Program or utility companies that do research).

⁵⁴ See annex 10 for detailed tables used to build these graphics.

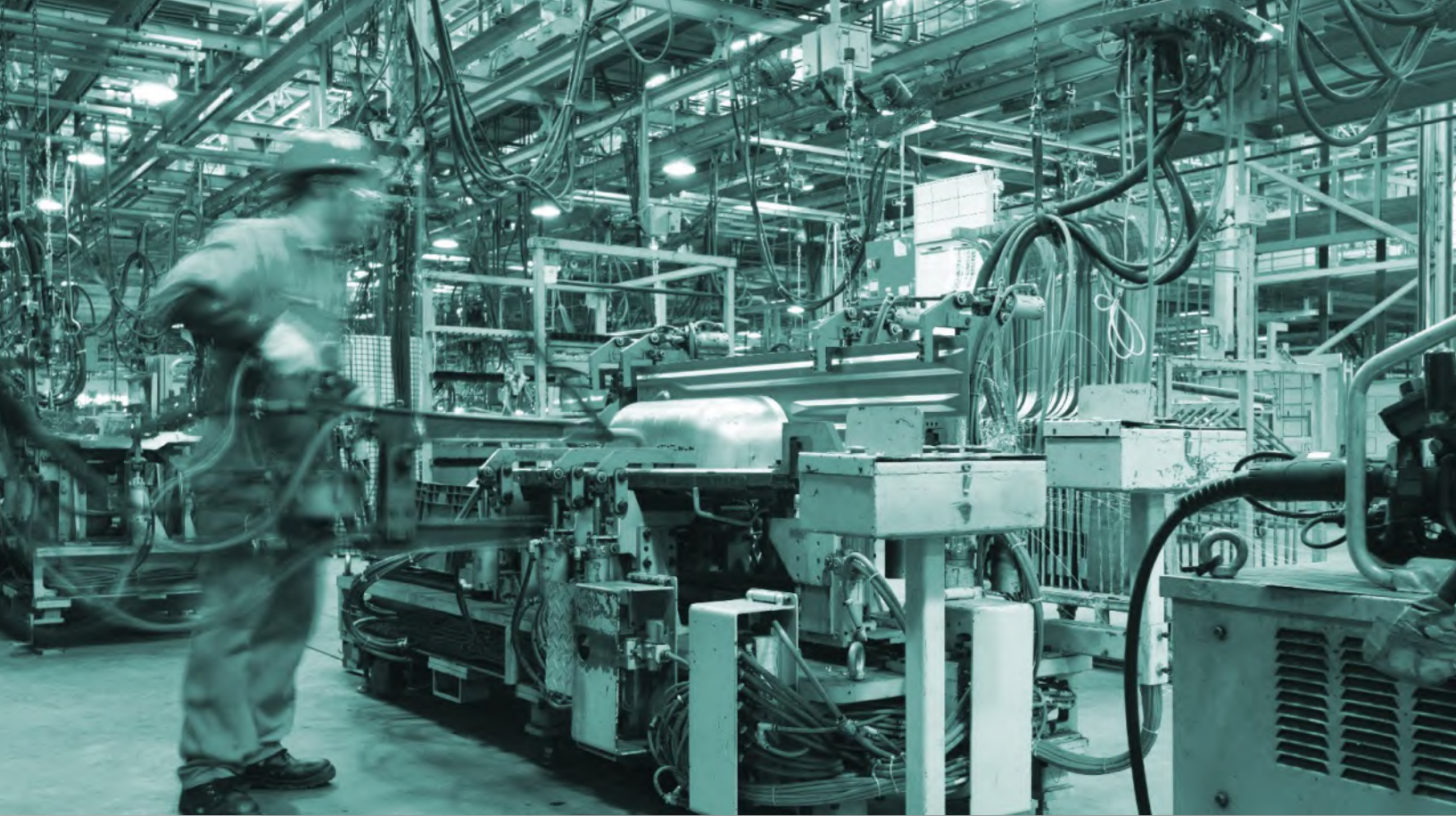
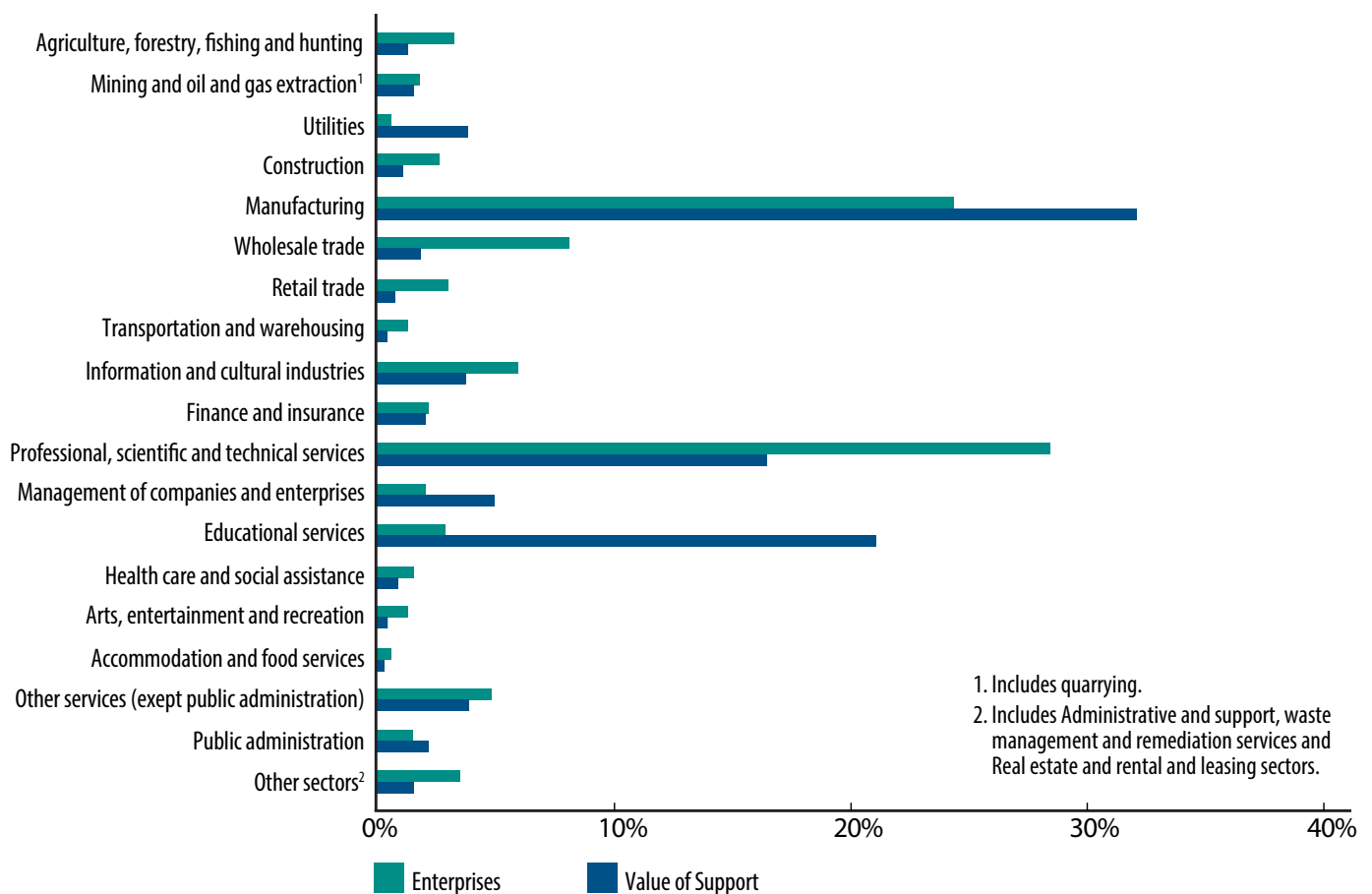


FIGURE 14 Business Innovation and Growth Support by Industry, 2017 (%)



8.

Intermediaries: Experimentation and Data Development



Third-party organizations (“intermediaries”)⁵⁵ can receive funding via Transfer Payment Programs (TPPs) to provide additional funding or services⁵⁶ to beneficiaries (e.g. firms). The Horizontal Innovation and Clean Technology Review (HICTR) reported that approximately forty percent of Business Innovation and Growth Support (BIGS) program spending was delivered via intermediaries. Currently, there is limited understanding of the outcomes achieved from support to intermediaries within the BIGS program suite as there are gaps in reporting across programs combined with requirements to maintain funding beneficiary anonymity for information collected by Statistics Canada. See Table 1

for examples of suppressed funding intermediary data to comply with confidentiality requirements of the Statistics Act (represented by an X in the table).⁵⁷

Statistics Canada data was used, referring to the 2017-18 PIF frame,⁵⁸ to explore BIGS support to departments, programs, funding and service intermediaries. Figures 15-21 are evidence that departments and programs are using intermediaries and have been historically. While the number of intermediaries used is not high, the amount of funding that is redistributed through these organizations is significant.⁵⁹ For some federal organizations, detailed information is available on the

TABLE 1 *Value of support to BIGS¹ enterprises² (Funding Intermediary)³ by type of support, program stream and year (dollars)*

TYPE OF SUPPORT	DEPARTMENT	PROGRAM STREAM NAME	YEAR OF SUPPORT ^{4,5}										
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Grant	NSERC: Natural Sciences and Engineering Research Council	Business-Led Network Centres of Excellence	...	a	X	X	X	X	\$11M	\$11M	X	X	X
		Centres of Excellence for Commercialization and Research	X	X	X	\$30M	\$31M	X	X	\$18M	\$16M	\$26M	\$20M
	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	X	\$26M	\$23M	X	X	X	X	\$29M	X	X	X
Non-Repayable Contribution	ACOA: Atlantic Canada Opportunities Agency	Atlantic Innovation Fund	...	...	X	X	X	X	X	X	...	X	X
		Business Development Program	X	X	X	X	X	X	X	X	X	X	X
	CanNor: Canadian Northern Economic Development Agency	Entrepreneurship and Business Development	...	...	...	...	...	...	...	...	X	X	X
	ECCC: Environment and Climate Change Canada	Science Horizons Youth Internship Program	...	...	...	...	...	...	...	...	X	X	\$14M
		Business Development and Community Innovation	...	...	...	...	...	...	...	\$8M	\$8M	\$8M	\$7M
	FedDev: Federal Economic Development Agency for Southern Ontario	Collaborative Economic Development Projects	...	...	...	...	...	...	...	X	X	X	X
		Investing in Business Growth and Productivity	...	...	...	...	...	...	...	X	X	X	X
		Investing in Business Innovation	...	...	...	...	...	...	...	X	\$6M	\$7M	\$10M
	GAC: Global Affairs Canada	Canadian International Innovation Program	X	X	X	X	X	X	X	X	...	X	X
		Futurpreneur Canada	...	...	...	...	...	...	...	...	X	X	X
	ISED: Innovation, Science and Economic Development Canada	Northern Ontario Development Program	...	\$5M	\$2M	\$2M	\$3M	\$5M	X	\$7M	\$5M	\$5M	\$8M
		Technology Demonstration Program	...	...	...	...	...	...	...	X	X	X	X
	NRCan: Natural Resources Canada	Green Jobs - Science and Technology Internship Program	...	...	...	...	...	...	...	...	...	X	\$7M
	PCH: Department of Canadian Heritage	Experimental Stream	...	...	...	X	X	X	X	X	X	X	X
		New Musical Works	X	X	X	X	X	X	X	X	X	X	X
TOTAL (ALL TYPES)	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	\$75M	\$49M	\$44M	\$197M	\$196M	\$182M	\$186M	\$206M	\$223M	\$253M	\$253M

Source: Statistics Canada, Centre for Special Business Projects (2020)

Notes

1. Business Innovation and Growth Support (BIGS) data includes a significant number of consulting services as well as enterprises in a consortium with no reported value of support.

2. This table shows only enterprises that were matched to the Business Register. “Enterprise”, as a statistical unit, refers to the highest level of the Business Register statistical hierarchy.

3. Original language used Third Party Delivery Funding Program Stream, replaced by “Funding Intermediary”.

4. Year-over-year comparisons should be made with caution. Year-over-year differences in the number of enterprises and support values may be the result of changes in departmental financial systems and the availability of data rather than changes to the programs.

5. In this table, a single enterprise could be in many years and in many programs. “...” indicates “not applicable”; “X” indicates that the value is suppressed to meet the confidentiality requirements of the Statistics Act.

55 See Annex 7 for a complete definition of intermediaries.

56 Technical, business and advisory services through incubators, accelerators, hubs, centres of excellence etc.

57 See Annex 10 table 5 for examples of suppressed service intermediary data in compliance with confidentiality requirements of the Statistics Act.

58 See Annex 10 for tables. These Statistics Canada tables present intermediary usage identified by programs for the 2007/08-2017/18 data collection cycle. They are subject to annual update.

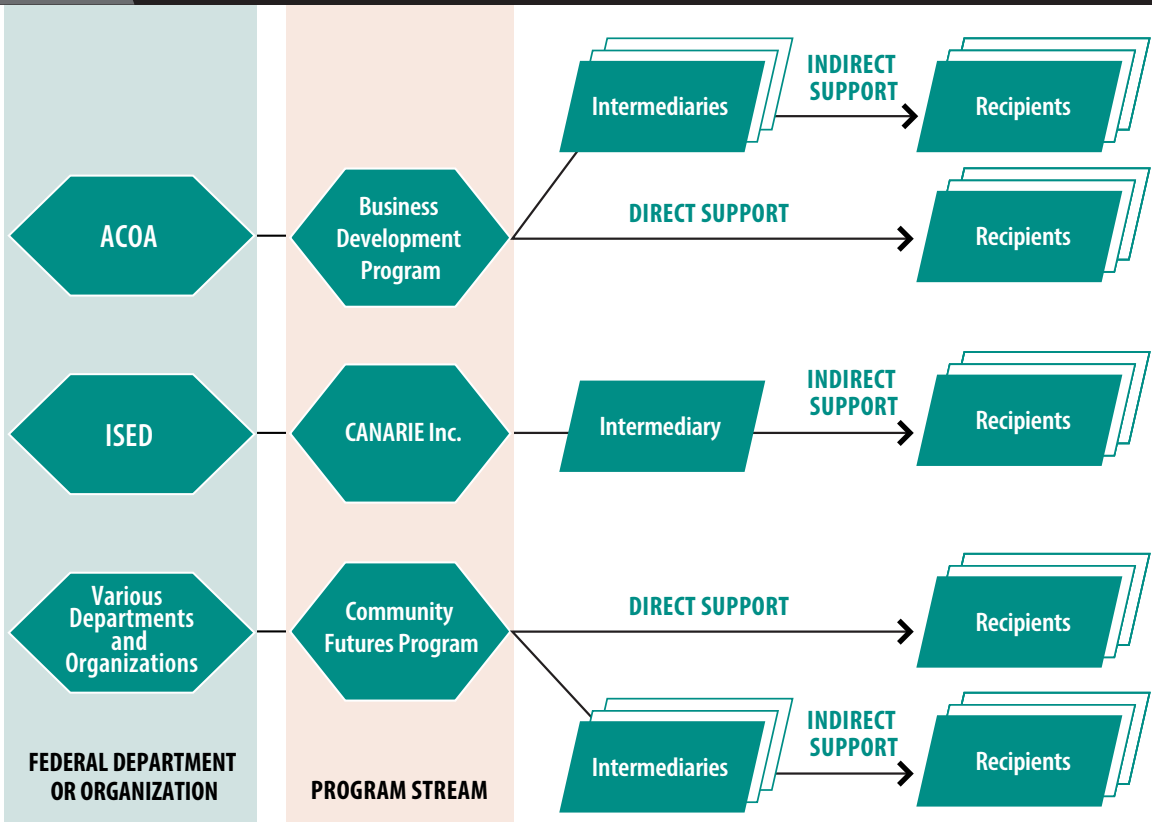
59 See Annex 11 for a list of departments and programs that utilize funding and service intermediaries to deliver programming.

ultimate beneficiaries of services or funding provided through intermediaries, but in others, data is either not collected or cannot legally be shared with federal organizations outside Statistics Canada.⁶⁰

The nature and extent of relationships between recipients, intermediaries, programs, federal departments/organizations and the associated achievement of outcomes will be research priorities for the CPIAU in upcoming years. Figure 15⁶¹ illustrates some of the various possible combinations of how program streams are delivered through intermediaries. The Community Futures Program is delivered through various federal organizations, sometimes using intermediaries (indirect support) and sometimes not (direct support). The CANARIE Inc. program stream is delivered through

the non-profit organization CANARIE Inc. (indirect support) whereas ACOA's Business Development Program is delivered both through indirect and direct support. Understanding the multiple relationships that exist between federal organizations, program streams, intermediaries and ultimate beneficiaries is key to filling data gaps. Of critical importance, and a subject of future CPIAU analysis, is understanding the contractual commitments made by intermediaries in exchange for funds as well as criteria for reporting on outcomes, as described in funding agreements. Further, the current Policy on Transfer Payments is silent on reporting requirements linked to the Policy on Results as well as longer-term statistical study of program outcomes. Further policy guidance would help address this gap.

FIGURE 15 Examples of BIGS Programs Delivered via Direct (No Intermediaries) and Indirect Support (Intermediaries)

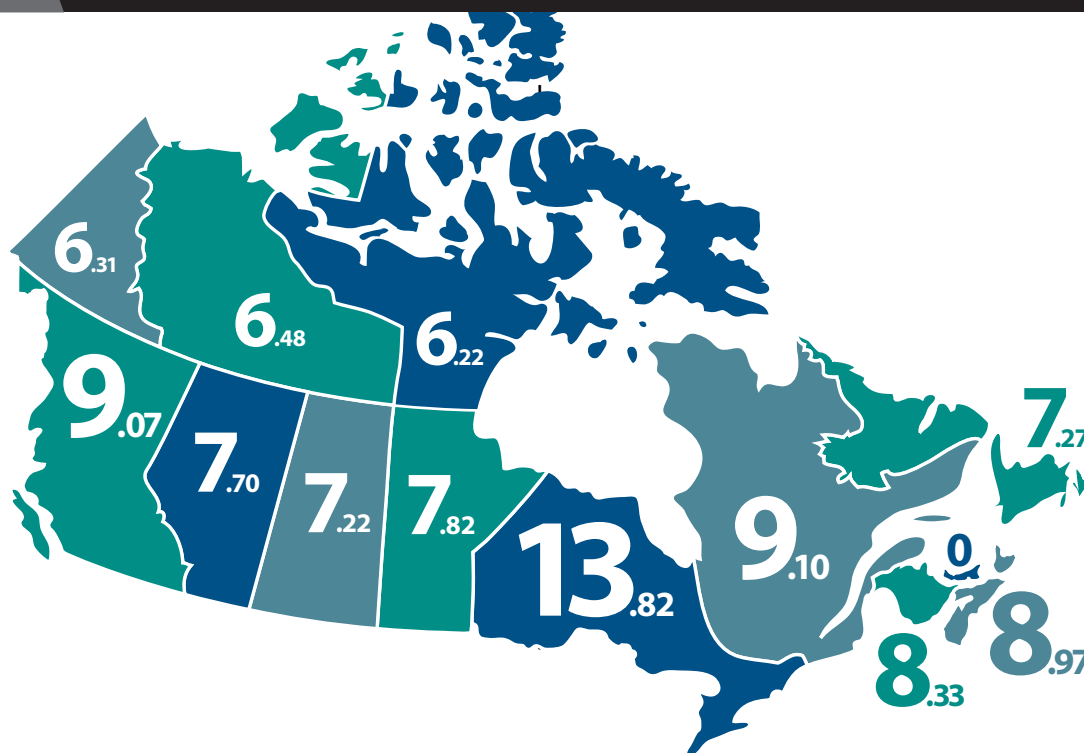


60 For example, in the cases where data was not collected with informed consent.
 61 Figures are derived from self reported intermediary usage from the 2018-19 PIF frame and analysis of the Proactive Disclosure data set.

Academic literature provides a rationale for using intermediaries to deliver government programs, with caveats, “third parties provide important advantages to the federal government – they enhance the legitimacy of the federal presence, share the costs, provide critical skills and authorities not available to the federal government, and help adapt federal programs to unique local conditions and needs. However, they also complicate the projection of national goals and raise unique accountability challenges.”⁶² For example, it is not clear “how best to maximize the quantity and quality of governmental product when the point of finance is split and often two or even three levels removed from the point of final output.”⁶³

In order to explore the extent to which intermediaries are prevalent for BIGS programs, the Proactive Disclosure (PD) data set⁶⁴ was matched to departmental/organizational self-reported intermediaries from the 2018-19 PIF frame as an experiment to determine what insights could be gained from publicly available data. This experiment found that BIGS programs use funding intermediaries to varying degrees for program delivery across Canada and that there is a measure of regionality in the use of intermediaries that reflects business and population density. Current estimates suggest that since 2014, the federal government has transferred the largest amounts of funding to intermediaries in Ontario, Québec and British Columbia (see Figure 16). Within Ontario and Québec, most of the intermediary funding agreements established since 2014 were in Toronto, Ottawa⁶⁵ and Montreal.

FIGURE 16 BIGS Programs Delivered by Intermediaries Across Canada 2014-2019⁶⁶



⁶² This study refers to the American government, however, the ideas are deemed relevant to the Canadian context (Accountability Challenges of Third Party Governance-Posner, 2004).

⁶³ Source: Posner, 2004.

⁶⁴ Figures 16 and 22 represent a snapshot of current estimates of BIGS program intermediary funding based on [Proactive Disclosure – Grants and Contributions](#) As of September 2019

⁶⁵ This includes an agreement for CANARIE with a start date of April 1, 2020.

⁶⁶ Figures represent the estimated relative use of intermediaries across Canada. In order to be able to produce a map to scale, this map is based on the squared root of the sum of funding agreements to intermediaries who received more than \$1 million in funding either via one or multiple funding agreements from 2014 to 2019. These figures are self-reported by departments in the proactive disclosure data, as of September 2019. The 2014-2019 cohort was chosen to be able to capture a 5-year period.

FIGURE 17 Value of BIGS Support to Service and Funding Intermediaries⁶⁷

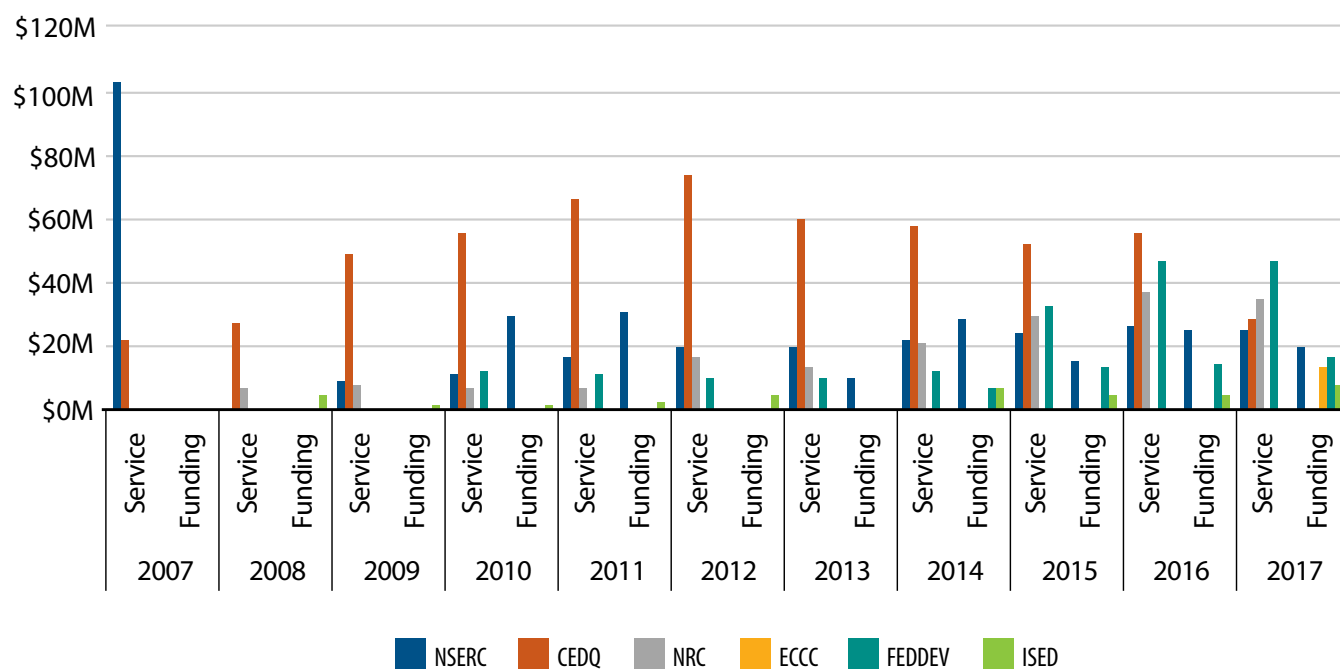
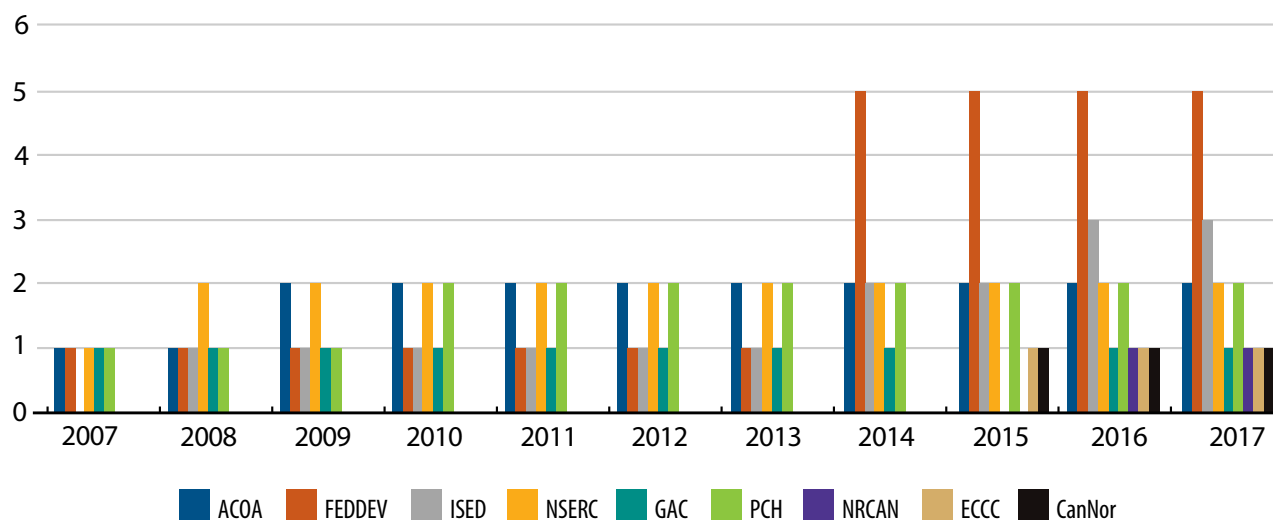


FIGURE 18 Number of BIGS Programs Using Funding Intermediaries⁶⁸



⁶⁷ These represent the total value of funding delivered by federal government departments to funding and service intermediaries.

⁶⁸ Number of program streams associated with either a non-zero support amount or a suppressed value for a given year.

FIGURE 19 Number of BIGS Programs Using Service Intermediaries

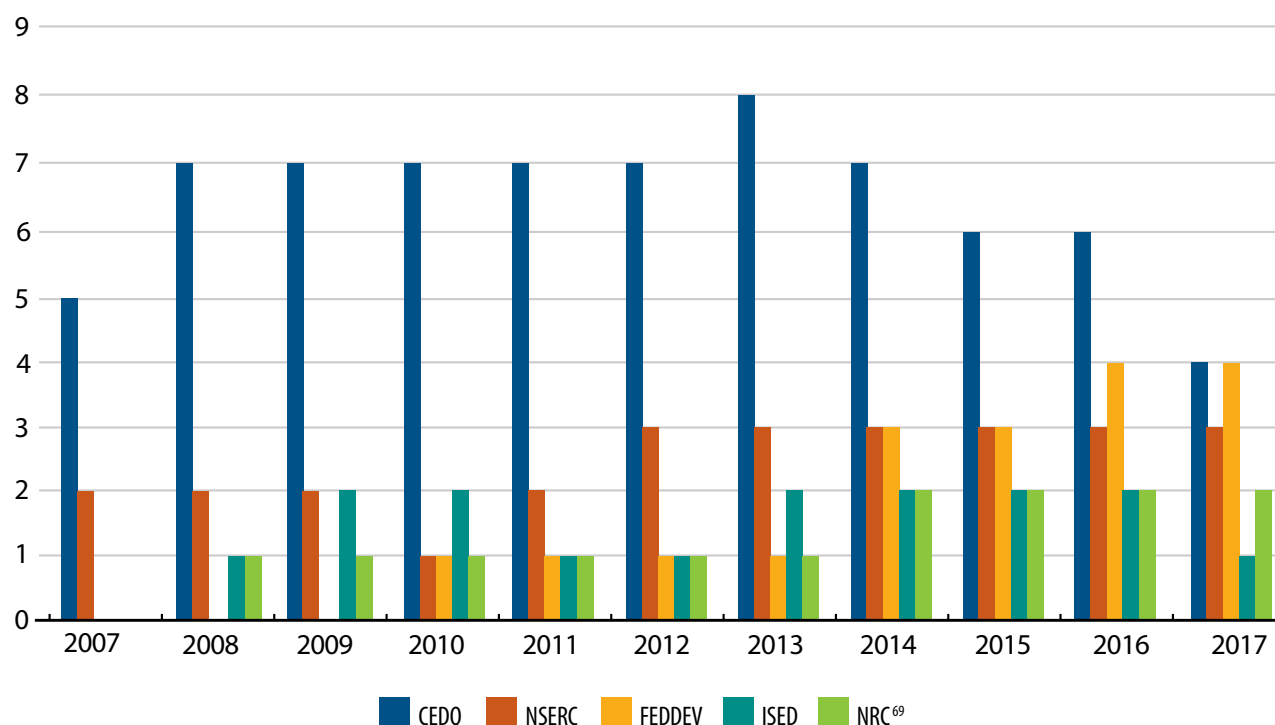
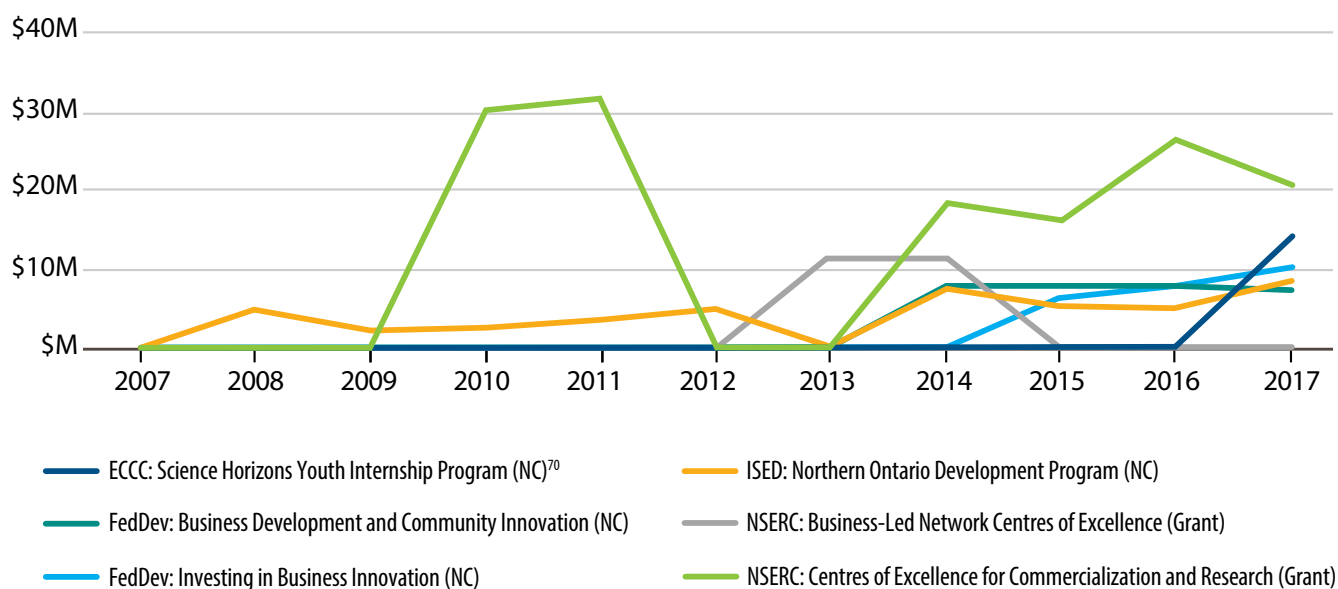


FIGURE 20 Value of BIGS Support to Funding Intermediaries by Department and Program



69 National Research Council.
70 Non-repayable Contribution.

FIGURE 21 Value of BIGS Support to Service Intermediaries by Department and Program⁷¹

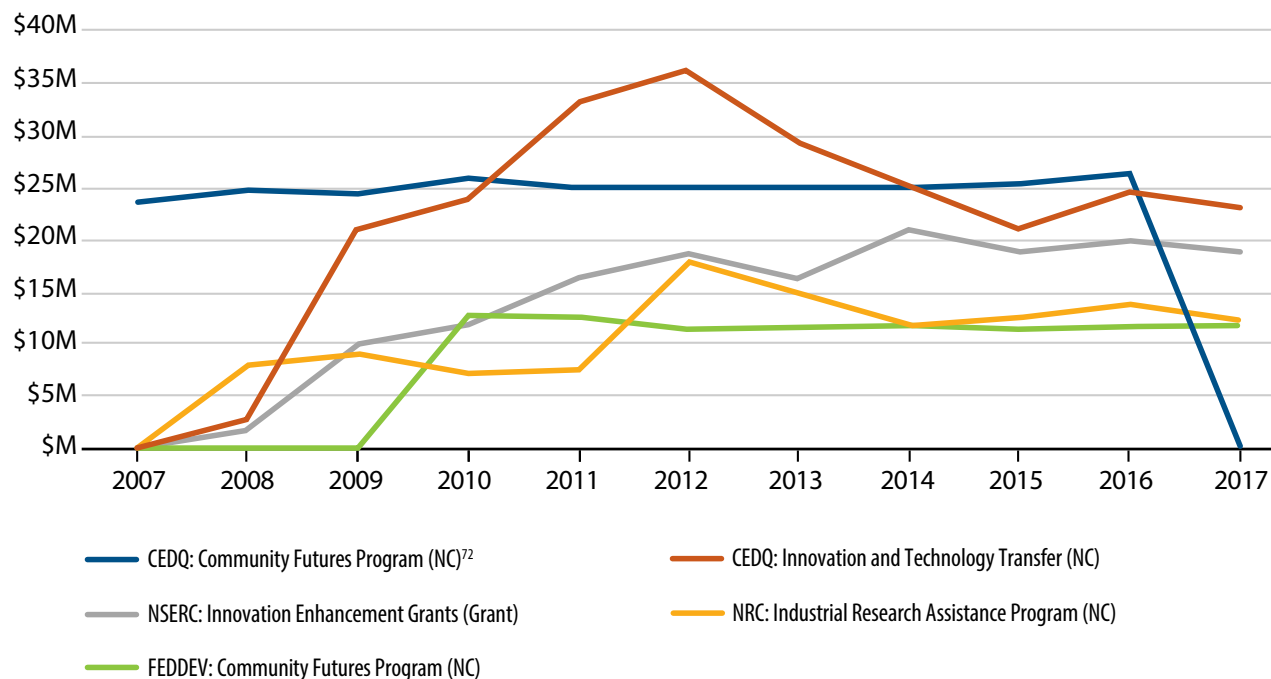
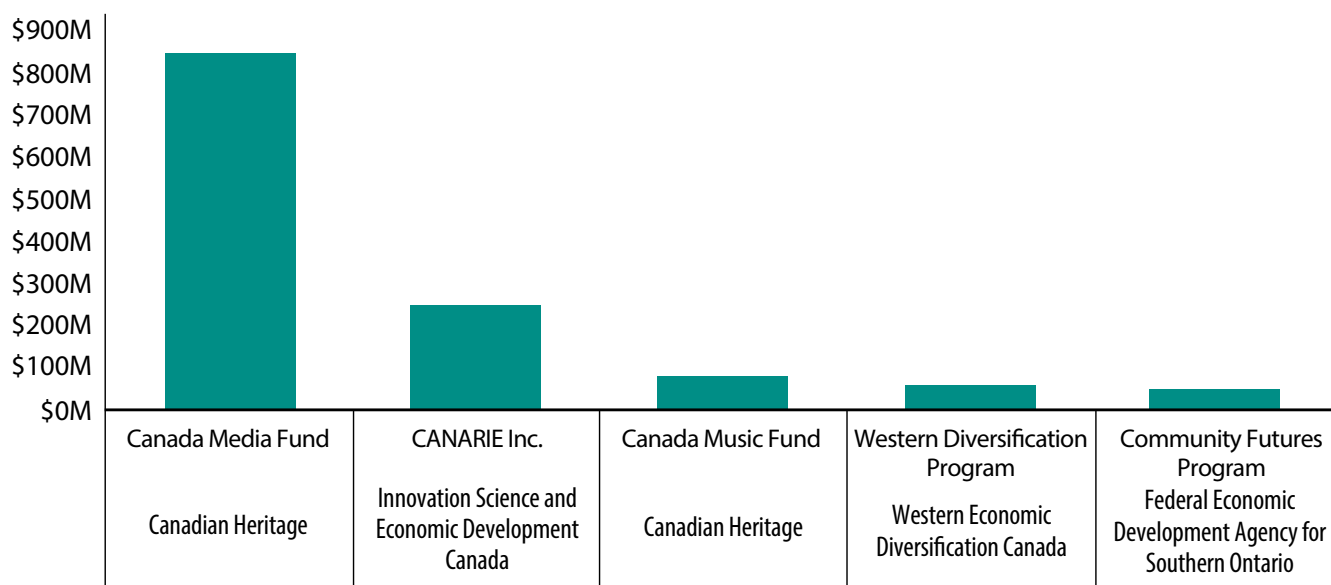


FIGURE 22 Value of Support to Intermediaries by Program and Federal Organization, 2014-2019⁷³



⁷¹ See Annex 10 Table 5, non-repayable contributions via the CFP (Canada Economic Development for Quebec Regions) marked by an X value for 2017, which means the value of support was suppressed due to confidentiality, possibly implying that there were less beneficiaries in 2017 than other years.

⁷² Non-repayable Contribution.

⁷³ This figure displays the federal organizations and programs (either TPPs or Program Stream) with the greatest total amounts in funding agreements based on proactive disclosure data from 2014 to 2020.



Analysis of the proactive disclosure data set using the 2018-19 PIF frame (as opposed to the 2017-18 frame used for figures 16-21, tables 1 and 5) over the period of 2014-2019 support Statistics Canada figures regarding the identification of the major players (federal organizations and programs) utilizing intermediaries for program delivery. One difference between the more recent proactive disclosure data (2018-19), and the STC data (2017-18) is the relative significance of intermediaries for some organizations. For example, in the former, Canadian Heritage and Western Economic Diversification Canada use intermediaries to a greater extent than in the latter (see Figure 22). This type of nuance may inform future research questions regarding the use of intermediaries to deliver federal programming.

BIGS Intermediary Funding: Expected Outcomes by Department/Organization

In the absence of the funding agreement details, it is interesting to consider the descriptions and expected results, as described by federal organizations, at the time of funding agreement inception⁷⁴ to better understand the expected outcomes associated with funding provided to intermediaries. For example, the Canada Media Fund program, administered by Heritage Canada (PCH) employs intermediaries to:

- fund high-quality Canadian television programs, originally broadcast on Canadian television services during peak viewing hours or made available on digital services
- make available to Canadians on at least one other platform digital value-added content related to funded programs
- develop projects funded through the Experimental Component for commercial potential or public use

⁷⁴ The proactive disclosure data set is incomplete, while some federal organizations included detailed information on descriptions and expected results associated with specific funding agreements, this reporting is not consistent across all programs/organizations. As a result, the text presented in this section is derived from either the description or expected results columns in the proactive disclosure data set, as available.

Similarly, the CANARIE Inc. program, administered by Innovation, Science and Economic Development Canada (ISED) employs intermediaries to:

- continue to operate the CANARIE network as essential research infrastructure
- develop, demonstrate, and implement next-generation technologies to advance the CANARIE network as a leading-edge research network
- leverage the network to assist firms operating in Canada and Canadian universities to advance innovation and commercialization of products and services to bolster Canada's technology innovation capabilities
- connect more than one million scientists, researchers and educators at over 1,100 institutions across Canada to stimulate research, innovation and growth

The Western Diversification Program, administered by Western Economic Diversification Canada (WD) employs intermediaries to:

- launch Edmonton Global's International Investment and Trade Program
- expand the Venture Connection accelerator to support youth entrepreneurship in British Columbia

The Community Futures Program, administered by the Atlantic Canada Opportunities Agency (ACOA)⁷⁵ employs intermediaries to:

- undertake network device upgrades
- support management information systems
- provide financial support for marketing activities
- support governance and education training

- provide entrepreneurial training
- purchase capital equipment
- provide financial support for external/portfolio review

Performance measurement is a challenge for programs that deliver funding and/or services through intermediaries including the Community Futures Programs (CFPs) delivered through Regional Development Agencies (RDAs). For example, in the evaluation of CFPs⁷⁶ intermediaries reported high administrative burden associated with collecting performance information.

While there is a trade-off between data collection requirements and program costs, the large amount of funds being provided to intermediaries and the limited visibility into the impacts of these programs on the firms they support indicates a need for improvement. From the evaluations reviewed, evaluations examining the impact of programs primarily delivered through intermediaries recommended that program management improve information technology and other tools to address gaps in performance measurement. It is clear that intermediaries are integral to government program delivery for Canadians; however, they are not fully captured in government administrative data.

⁷⁵ As noted in previous footnote, proactive disclosure data quality is inconsistent regarding the description and expected results columns. In this case, descriptions for FedDev administered Community Futures Program funding agreements were lacking. Instead, the descriptions for the CFP administered by ACOA are presented. For 2014-2019, ACOA funding agreements to intermediaries totaled \$14 million, using the same methodology and sources as figure 22.

⁷⁶ This refers to the evaluations conducted by regional development agencies including the Atlantic Canada Opportunities Agency (ACOA), Canada Economic Development for Quebec Regions (CEDQ), Western Economic Diversification Canada (WD) and the Federal Economic Development Agency of Southern Ontario (FedDev). The [horizontal evaluation of CFPs](#) was out of scope for the evaluation synthesis because it was published in June 2019. The horizontal evaluation does not mention intermediaries or third-party delivery.

9.

Future Considerations for Program Design and Policy Development



■ With boutique programs that serve small target populations, comes the necessity for customized evaluation methods.

Program efficiency measurement, from a Canadian taxpayer perspective, requires balance. On one hand, large programs that are entrusted to deliver impacts over time should be thoroughly understood and relatively simple to report on. On the other, smaller programs, or those that respond to urgent needs, must be agile and not weighed down by bureaucratic requirements. While the BIGS policy suite affords government this required flexibility, it falls short for larger programs that would profit from a clearer understanding of the resources required to arrive at results. CPIAU foundational analysis presented in this report leads to questions regarding the need for policy change in order to address the circumstances that make program efficiency measurement, and therefore understanding the value of programs, challenging.

The current *Policy on Results* mandates program designers to plan for performance measurement at the time of program inception, and new information has become available in this report for their consideration. With boutique programs that serve small target populations, comes the necessity for customized evaluation methods. Some data associated with these smaller programs cannot be released in order to protect confidentiality of firms and/or individuals. This underscores the importance of engaging the evaluation function early in the process of identifying a strategy to measure the

performance of a new program, to ensure an appropriate data strategy is in place.

Also key is understanding the role of intermediaries in program delivery, which, based on HICTR estimates, may represent up to 40 percent of BIGS program delivery. The analysis of BIGS program data alongside Proactive Disclosure information confirms that intermediaries are an important program delivery mechanism for BIGS programs. For example, in 2017, BIGS departments delivered at least \$430M to funding and service intermediaries and have used intermediaries to varying



degrees in each year since 2007.⁷⁷ When government entrusts experts to deliver programs and services in key areas of the economy, care must be taken to ensure data is both collected and sharable so that the full results story can be communicated through performance measurement and evaluation. Updating guidance to better reflect the Government of Canada's statistical requirements as the policy suite is updated will facilitate better data collection in this respect. If these relationships are as important to program delivery for BIGS programs as they appear to be, it is critical for government to have the capacity to tell their results stories.⁷⁸

Further to this, there is a significant body of knowledge to be created and shared in Canada with respect to our central data asset, its potential, and the light it is beginning to shine on program design, performance and government's inherent capacity to report. As data gaps are addressed and new methods established, sharing insights on program-appropriate impact assessment methods will be critical. The CPIAU will strive to ensure research is carried out transparently, and that results are made available to data providers and program designers.

Existing work, analytical and research resources and updates on the unit's activities are currently posted on GCCollab and are available via other means by request. The unit will also continue to engage across the public service to help develop the knowledge and skills required of the users of this new data asset across all functions that need to access or contribute to its development and maintenance.

On the performance of the programs themselves, as Government delves deeper into the central data asset, it has become evident that there are synergies between those measures created by the experts in the performance measurement discipline and those measures available to us in Statistics Canada's Linkable File Environment. As government drives toward a more robust understanding of how to leverage firm-level data as well as new methods, helping performance measurement adopt more administrative data will serve to fuel better comparative analysis among programs as well as help identify programs driving at genuinely unique objectives. This work will address some of the key limitations identified in evaluation reports and promises to strengthen the function going forward.

The CPIAU will strive to ensure research is carried out transparently, and that results are made available to data providers and program designers.

77 \$430M is the sum of the 'total' columns in tables 1 (text) and 5 (see annex 10) 2017 (\$253M + \$177M).

78 See Annex 9 for a list of BIGS programs with upcoming evaluations and previously identified challenges with data and impact assessment.

Annex 1

LFE Data Sources

LFE - Data Sources (Administrative data)

- Business Register (BR) – 2000-2018 (SDDS 1105)
- Longitudinal Employment Analysis Program (LEAP) - 2000-2015 (SDDS 8013)
- General Index of Financial Information (GIFI - T1) Unincorporated Businesses -2005-2018
- General Index of Financial Information (GIFI -T2) Incorporated Businesses - 2000-2018
- Statement of Remuneration Paid (T4)– 2000-2017
- Payroll Deductions Account (PD7) - 2001- 2018
- Exporter Register – 2010- 2018 (SDDS 2201)
- Importer Register – 2012, 2015 - 2018 (SDDS 2201)
- Patents (Canadian Intellectual Property office) – 2001- 2006
- United States Patent Office (USPTO) Canadian Enterprises only - 2000- 2011
- BIGS (Business Innovation and Growth Support) database - 2007-2017
- Schedule 32 – 2000 – 2017
- Survey of Electronic Commerce Technology (SECT) 2000-2007 (SDDS 4432)
- Survey of Advanced Technology (SAT) 2007, 2014 (SDDS 4223)
- Survey of Commercialization of Innovation (COI) - 2007 (SDDS 5140)
- Survey on Financing and Growth of Small and Medium Enterprises (SFSME) – 2004, 2007, 2011, 2014, 2017 (SDDS 2941)
- Survey of Intellectual Property Management (SIPM) - 2010 (SDDS 5183)
- Survey of Digital Technology and Internet Use (SDTIU) – 2012, 2013 (SDDS 4225)
- Census of Agriculture – 2016
- Survey of Regulatory Compliance Costs (RCC) – 2011 (SDDS 5093)

LFE - Data Sources (Survey data)

- Annual Survey of Research and Development in Canadian Industry (RDCI) - 2000-2017 (SDDS 4201)
- Canadian Direct Investment Abroad (CDIA) 2000-2013 (SDDS 1537)
- Foreign Direct Investment in Canada (FDIC) - 2000-2013 (SDDS 1537)
- Trade in Commercial Services (TICS) 2000-2014 (SDDS 1536)
- Survey of Innovation and Business Strategy (SIBS) 2009, 2012, 2017 (SDDS 5171)
- Surveys of Innovation (INNO) 2003, 2005, (SDDS 4218)
- Survey on Cybersecurity
- Canadian Defence, Aerospace and Marine Industries Survey, 2016
- Survey of innovation and Business Strategy (SIBS), 2019
- Survey of Digital Technology Internet Use (SDTIU), 2019
- Survey of Regulatory Compliance Costs (RCC), 2016
- Intellectual Property Awareness and Usage Survey (IPAUS), 2019

Annex 2

Terms of access to LFE Data

Terms of access to the BIGS research database at enterprise level linked to LFE:

The data for this program is acquired under section 13 of the Statistics Act, while their confidentiality is protected under subsection 17 (2) of the Act. All micro data access at Statistics Canada require a valid 'deemed employee status' under subsection 17 (1).

Direct access to the BIGS research database at enterprise level (2007-2017):

- For the benefit of third-party researchers, STC will provide notice of the annual data collection processes, and availability of microdata on its website as an annual collection activity, and as a data source in the LFE.
- The BIGS research database linked to LFE is available:
 - at the Canadian Centre for Data Development and Economic Research (CDER) for research purposes (Econometric analysis only).
 - at the Centre for Special Business Projects (CSBP) if the purpose of the work is the production of a descriptive report (Tabulations; Graphs). CSBP offers a collaborative mode of access where the tables are produced by CSBP staff following the researcher's specifications and the researcher produces a report on site at CSBP.
- Researchers wishing to access data must submit a formal research proposal and be able to cover all project costs.

The statistical information stored in the BIGS operational database is not linked to LFE.

The BIGS operational database information:

- The information in the BIGS operational database is not available to external researchers, because of STC confidentiality concerns. It is accessible only by CSBP employees and deemed employees for validation purposes.
- When feasible, special aggregated tabulations based on the BIGS operational database could be extracted by CSBP on demand, and Statistics Canada will inform and coordinate with CPIA (cost recovery services).
- Statistics Canada will review all outputs at their completion to ensure that the results are in line with the project scope and that data confidentiality is maintained.

Annex 3

List of GoC and international sources

GoC policies and directives (The Policy Suite)

[*Policy on Classification*](#)

[*Financial Administration Act*](#)

[*Directive on Open Government*](#)

[*Directive on Public Money and Receivables*](#)

[*Policy on Results*](#)

[*Policy on Service*](#)

[*Guideline on Service Management*](#)

[*Policy on Transfer Payments*](#)

[*Directive on Transfer Payments*](#)

[*Guideline on the Directive on Transfer Payments*](#)

Other GoC sources

[*Canada Revenue Agency: Business number registration*](#)

[*ISO 19115:2003, Standard on Geospatial Data*](#)

[*Statistics Canada: Administrative data – Frequently Asked Questions*](#)

[*Statistics Canada: Canadian System of Macroeconomic Accounts*](#)

[*Statistics Canada: Definitions, data sources and methods: Statistical units*](#)

[*Treasury Board of Canada Secretariat: Guide to Rapid Impact Evaluation*](#)

International sources

[*Organization for Economic Co-operation and Development: Glossary of Key Terms in Evaluation and Results Based Management \(2010\)*](#)

Organization for Economic Co-operation and Development: Oslo Manual 2018

Annex 4

Business Innovation⁷⁹ and Growth Support (BIGS) Inclusion Criteria

INNOVATION ACTIVITIES OF ENTERPRISES		
INNOVATION TYPE	ELIGIBLE ACTIVITIES ⁸⁰	INELIGIBLE ACTIVITIES
Product (good or service) innovation.	Significant improvements to product's characteristics or specifications such as new functions, quality, durability, efficiency, convenience, user-friendliness or design features.	Minor aesthetic changes such as changes in a product's colour or minor change in shape or minor software updates (e.g. bug fixes, etc.). Routine including seasonal changes or updates such as in clothing fashions, foods, beverages or ornamentation. Resale of new goods purchased from other businesses.
BUSINESS PROCESS INNOVATION	ELIGIBLE ACTIVITIES	INELIGIBLE ACTIVITIES
Production of goods or services (activities that transform inputs into goods or services).	Research and experimental development (R&D) (e.g. basic research, applied research and experimental development of R&D carried out or paid for by a firm). Engineering, design and other creative work (i.e. engineering and related testing, design and other creative work, analysis and certification activities to support production, except if minor changes).	Routine engineering processes such as day-to-day production or quality control for existing processes. Simple capital replacement or extension such as purchasing of identical or nearly identical replacements or repairs. (See Business Growth Activities for more information).
Distribution and logistics (transportation and service delivery, warehousing, order processing).	Implementation of new processes and technologies to improve distribution and logistics functions, for example using integrated Internet of Things (IoT) systems where devices and objects have networking capabilities to exchange information on equipment maintenance, warehouse stock-levels, new orders and returns or exchanges.	Simple capital replacement or extension such as purchasing of identical or nearly identical replacements or repairs. (See Business Growth Activities for more information).
Marketing and sales (marketing and advertising activities, pricing strategies and methods, sales and after sales activities).	Innovative products' marketing activities such as preliminary market research, market testing, launch advertising, development of pricing mechanisms, product placement methods and after-sales support strategies. Innovative business processes' marketing activities such as promoting environmental benefits, improved product quality and business practices (e.g. workforce inclusivity, regulatory compliance, ethical production, etc.). Marketing and brand promotion for existing products where the marketing practice is new for the product.	Routine marketing and advertising processes such as seasonal sales campaigns and market research for new sites, locations or demographics for existing products.

⁷⁹ "A business innovation is a new or improved product (good or service) or business process (or combination thereof) that differs significantly from the firm's previous products or business processes and that been introduced on the market or brought into use by the firm." OECD. Oslo Manual 2018, p.67.

⁸⁰ Broad categories of activities that a firm can undertake that are relevant to innovation and can be supported by business innovation and growth support programs.

INNOVATION ACTIVITIES OF ENTERPRISES		
BUSINESS PROCESS INNOVATION	ELIGIBLE ACTIVITIES	INELIGIBLE ACTIVITIES
Information and communication systems (provision and maintenance of hardware and software, data processing and databases, web-hosting).	New or improved information communication systems activities such as business intelligence or cloud-based computing systems, big-data analytics, encryption or advanced authentication systems, blockchain technology, etc.	Routine changes or updates such as software updates or debugging.
Administration and management (strategic and business management, corporate governance, accounting, financial and insurance activities, procurement, human resource management, supply chain management).	Employee training in the use or implementation of new or improved products or business processes, new software logistical systems, new equipment, or new or improved features or benefits. Intellectual property (IP) (ex. application of IP rights, licensing-in or licensing-out IP rights).	Employee training for general skills upgrading, on existing products or business processes or language training. (See Business Growth Activities for more information.)
Product and business process development (activities to scope, identify, develop or adapt products or a firm's business processes).	Product and business processes activities include production trials to optimize efficiency of new processes; creating of prototypes for temporary commercial or regulatory needs; and planning and designing procedures, technical specifications for new or improved products or business processes.	Standard or routine product and business process updates.
GROWTH ACTIVITIES OF ENTERPRISES		
Follow-on activities (marketing, training, after-sales services, etc.) for post-implementation of new or improved products or business processes.	Follow-on marketing activities that promote new or improved products' (or business processes) sales such as customized advertising campaigns, exhibiting at trade fairs, participating in international trade junkets and other market exploration activities, or adopting new distribution channels. Follow-on training activities to promote user adoption which can include in-house training of employees, users' demonstrations or onsite training or posting of user self-learning resources and guides. After-sales services that improve the utility of the new or improved products (or business processes) for users such as installation and setup, updating and maintenance services, warranty and return schemes and user assistance and communication services.	Routine updates to business tools such as websites and product catalogues.
Physical capital investment expected to increase production and lead to growth (revenues or employment).	Purchases of additional and identical or nearly identical machinery and equipment.	Repairs of machinery and equipment. In exceptional circumstances such as unstable supply chains or disaster recovery, repairs to machinery and equipment may be considered eligible under business growth.

GROWTH ACTIVITIES OF ENTERPRISES		
Participation in market expansion activities including global market development activities intended to increase growth in exports and revenues.	Sponsorship of participation in interprovincial or international trade missions and other market expansion and development activities.	
Investment in human capital including employee skills upgrading, language training, entrepreneurship and other human resource attraction, development and retention activities expected to increase workforce effectiveness.	Employee training for general skills upgrading, on existing products or business processes or language training. Participation in job-training programs (new Canadians), student placements, workforce interchanges (within and outside the country), entrepreneurship development and other human capital capacity building activities that target specific populations such as women, Indigenous peoples, visible minorities and the LGBTQ2 communities.	In cases of short supply in the domestic labour market, human capital attraction activities such as acquisition of foreign workers may be eligible under business growth.
ECO-SYSTEM OR COMMUNITY ACTIVITIES FOR BUSINESS INNOVATION AND GROWTH		
New or improved place-based infrastructure investments that improve the quality of life for workers or that attract new businesses to the community.	Sponsoring the development of new or significantly improving existing place-based infrastructure that enhances the appeal of the community for new business investment or local business expansion.	Routine or regular maintenance of physical infrastructure generally undertaken by municipal, regional or provincial governments such as repaving streets, fixing potholes, inspecting community facilities, replacing park equipment or building schools.
Community-based programs or networks that encourage or accelerate commercialization of new knowledge (intellectual property) and business development.	Participation in business accelerators, incubators, science parks and other non-profit community-based business accelerators, incubators, science parks and networks intended to promote commercialize of intellectual property and support business growth (start-ups, spin-offs, etc.).	Private venture capital solely operated business accelerators, incubators or other ventures.

Annex 5

Common Performance Measurement Themes Captured by Indicator

THEME	DESCRIPTION	EXAMPLE
Access to Capital	Indicators measuring outcomes related to firms' ability to access capital (public or private)	Number of loans made to young entrepreneurs to establish new businesses
Business Dynamics	Indicators referring to the lifespan of firm and entry/exit behaviour in markets	Number of new firms created in targeted areas
Export Performance	Indicators referring to a measure of export value or status	Percentage points by which the growth in export sales of ACOA-assisted firms exceeds that of comparable unassisted firms
Funding Leveraged	Indicators referring the value of capital (tangible or intangible) generated as a direct result of receiving funding from a department	\$ value of incremental private sector investment attracted
GBA+	Indicators referring to the advancement of GBA + metrics	Percentage of loans made to establish women-led businesses
Innovation Capacity	Indicators documenting outcomes related to changes in firms' capacity to implement change in its current practices, products, markets, etc.	Number of co-created digital service-related prototypes and other products of experimentation
Jobs/Labour	Indicators referring to measures of employment change in terms of quantity or quality	Employment growth rate of firms receiving program funds or other assistance
Knowledge Networks	Indicators referring to outcomes where the joint participation of private and/or public actors to activities of knowledge creation was enabled	Number of medium-term innovation ecosystem targets that are met by entities
Output	Indicators measuring administrative activities of programs	Number of contribution agreements administered
Productivity	Indicators measuring change in the productivity capacity of firms, i.e. their efficiency in turning input into output	% savings from improved operations
Regulatory Compliance	Indicators documenting elements of positive or negative compliance to legislative instruments from the part of firms	% of Aquaculture operations that are in compliance with the Fisheries Act regulations
Research and Development	Indicators capturing outcomes related to industrial research and development activities and spending	Beneficiary investments in R&D as % of all investments * projects receiving support for R&D only
Return on Equity	Indicators measuring changes in relation to the equity position of firms	Financial return of the Venture Capital Action Plan (VCAP) funds-of-funds (pooled gross internal rate of return of the entire funds-of-funds)
Revenue	Indicators measuring changes in revenues from the part of firms	Value, in millions of dollars, of domestic and international sales of Canadian-authored titles by Canada Book Fund beneficiaries
Skills	Indicators measuring changes in the level of skills of labour market participants	Number of participants trained

Annex 6

Examples of STC data sets that could be leveraged to develop horizontal indicators and to assess firm level impacts of funding to BIGS programs

Export Performance: The Export Registry is a census of all exporters in given years. It contains information on the total value of goods exported by individual firms as well as commodity export breakdown and export destination for individual shipments.

Business Dynamics: The Longitudinal Employment Analysis Program (LEAP) is the backbone of the business dynamics analysis at Statistics Canada. The data can be leveraged to track entry, exit and mergers & acquisitions (M&A's) at the individual firm level.

Funding Leveraged: The T2 file contains corporate tax filings for individual firms (or their ultimate parent enterprise). It can be used to supplement indicators of this type by examining firm past fixed capital formation behaviour using tangible capital reported in the T2 Schedule 100 (Balance Sheet Information).

GBA+: The Canadian Employee-Employer Dynamics (CEED) database provides a framework to track women-owned businesses in Canada. The data can be leveraged

to analyze a number of aspects of these businesses such as survival, size, revenue growth etc.

Productivity: The National Accounts Longitudinal Microdata File (NALMF) can be used to track various measures of firm productivity at the provincial and sub-provincial levels.

Jobs/Labour: The National Accounts Longitudinal Microdata File (NALMF) can be used to track employment of firms at the provincial and sub-provincial levels.

Research and Development: The T2 file contains tax filings for all Canadian corporations, which includes Scientific Research and Experimental Development (SR&ED) Tax Incentive filings. This data can be used to proxy R&D expenditure at the individual firm level.

Revenue: The T2 file contains tax filings for all Canadian corporations, including Schedule 125 (Income Statement Information). This data can be used to obtain revenue from goods sold for individual firms.

Annex 7

Definition of Intermediary

An intermediary, also known as a third-party, is a beneficiary that is funded to deliver a third-party delivery program stream. A third-party delivery program stream is a program stream that is delivered by a beneficiary of a contribution. A third-party delivery funding program stream further distributes transfer payment program funding to beneficiaries (i.e. per appendices E and G in the *Directive on Transfer Payments*). For business innovation

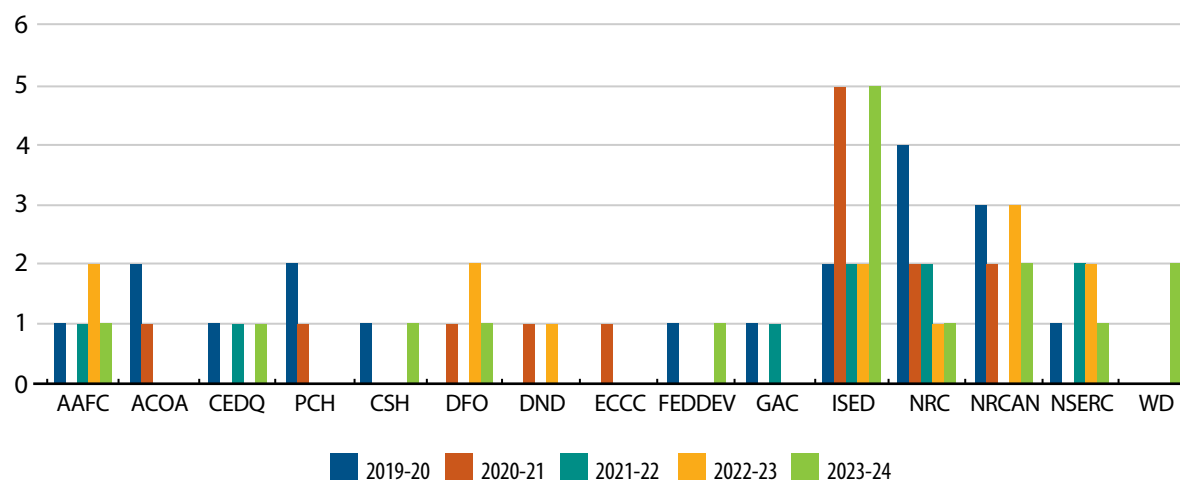
and growth support programs, the ultimate beneficiaries of a third-party delivery funding program stream include individual firms. A third-party delivery service program provides only non-financial support to its clients. For business innovation and growth support programs, the clients of a third-party delivery service program stream include individual firms.⁸¹

⁸¹ Source: Central Performance and Impact Assessment Unit.

Annex 8

Upcoming BIGS Evaluations

Planned BIGS Program Evaluations 2019-2024



Departments and Programs with Self-identified Quantitative Impact Assessment Challenges

DEPARTMENT	SCHEDULED EVALUATION(S) 2020-21	SCHEDULED EVALUATION(S) 2021-22
NRC	1. Ocean, Coastal and River Engineering 2. Construction	1. IRAP
ISED	1. Northern Ontario Development Program 2. Strategic Innovation Fund	1. Mitacs
GAC		1. Canadian Technology Accelerator Initiative
ACOA	1. International Business Development Sub-Program	

Annex 9

CPIAU Research Directions

In the future, the CPIAU intends to support research that will maximize the value of the BIGS data series to data stakeholders. BIGS research activities will allow programs to gain understanding of beneficiary perspectives.

Research on BIGS program activities seeks to strengthen:

- measurement of program outcomes using common indicators informed by BIGS data;
- estimation of enterprise-level impacts emphasizing horizontality, multi-program users and costs to outcomes;
- models for assessing impacts through the development of robust covariates;
- assessment of direct and indirect effects, intended and unintended impacts, spillovers and additionality within ecosystems; and
- experimentation with data development and quantitative techniques and methods to support performance evaluation and impact assessment.

CPIAU research seeks to answer two key questions:

1. Do BIGS programs activities have an effect on sustained results including the economic performance of beneficiaries and the quality of life of Canadians and Canadian communities?
2. What data, methods or techniques are available or are needed to inform evidence-based analysis?

These questions intend to solicit evidence to inform on whether BIGS programs are building capacity, supporting firm growth, and increasing productivity and community viability. The CPIAU seeks to determine whether BIGS programs are meeting objectives through beneficiaries. Further elaboration on the impacts and outcomes of program type (e.g. national, regional, direct or indirect), or support type such as (e.g. funding, services, grants or repayable contributions) will be developed. Experimentation with statistical techniques and methods and alternate data sources will be encouraged.

Annex 10

BIGS Data Tables

Table 2: Enterprises¹²³⁴ (ultimate beneficiary⁵) with business innovation and growth support by employment size and year

NUMBER OF ENTERPRISES IN CANADA					
EMPLOYMENT SIZE ⁶	2013	2014	2015	2016	2017
All employment sizes ⁷	18,991	20,453	22,029	22,733	22,405
0 to 4 employees	3,977	4,446	4,687	4,874	4,849
5 to 9 employees	2,260	2,396	2,637	2,779	2,731
10 to 19 employees	2,272	2,321	2,417	2,612	2,629
20 to 49 employees	2,421	2,458	2,763	2,848	2,882
50 to 99 employees	1,356	1,381	1,423	1,471	1,506
100 to 249 employees	1,045	1,030	1,147	1,156	1,165
250 to 499 employees	475	478	482	515	493
500 employees or more	796	801	850	863	841
No employment data	4,389	5,142	5,623	5,615	5,309

Source: Statistics Canada. Table 33-10-0219-01 Enterprises (ultimate beneficiary) with business innovation and growth support by employment size and year

Notes:

1. This table shows only enterprises that were matched to the Business Register. Enterprise, as statistical unit, refers to the highest level of the Business Register statistical hierarchy.
2. In this table, a given enterprise could be in many years.
3. Business Innovation and Growth Support (BIGS) data includes a significant number of consulting services as well as enterprises in a consortium with no reported value of support.
4. Year-over-year comparisons should be made with caution. Year-over-year differences in the number of enterprises and support values may be the result of changes in departmental financial systems and the unavailability of data rather than changes to the programs.
5. An ultimate beneficiary enterprise is an enterprise that benefits from the activities of a program stream. The support to an ultimate beneficiary can be direct from a department or indirect through an intermediary. For a given program stream, an intermediary can not be an ultimate beneficiary.
6. The data source for employment is the PD7 payroll deductions file. This file contains all employees for whom payroll deductions (Canada Pension Plan (CPP), Employment Insurance (EI) premiums, and income tax deductions) were paid by the employer to the Canada Revenue Agency.
7. An enterprise can be in only one employment size category in the same year.

Table 3: Enterprises¹²³⁴ (ultimate beneficiary⁵) with business innovation and growth support by revenue size and year

NUMBER OF ENTERPRISES IN CANADA					
REVENUE SIZE ⁶	2013	2014	2015	2016	2017
All revenue sizes ⁷	18,991	20,453	22,029	22,733	22,405
\$0 to \$249,999	4,119	4,783	5,109	5,284	4,979
\$250,000 to \$999,999	3,041	3,160	3,336	3,487	3,322
\$1,000,000 to \$1,999,999	1,714	1,792	1,909	2,039	1,984
\$2,000,000 to \$4,999,999	2,114	2,236	2,446	2,567	2,423
\$5,000,000 to \$9,999,999	1,503	1,480	1,594	1,646	1,692
\$10,000,000 to \$49,999,999	2,243	2,247	2,420	2,489	2,428
\$50,000,000 to \$99,999,999	456	488	532	520	541
\$100,000,000 to \$499,999,999	534	561	576	609	590
\$500,000,000 or greater	315	337	339	352	365
No revenue data	2,952	3,369	3,768	3,740	4,081
<p>Source: Statistics Canada. Table 33-10-0220-01 Enterprises (ultimate beneficiary) with business innovation and growth support by revenue size and year</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. This table shows only enterprises that were matched to the Business Register. Enterprise, as statistical unit, refers to the highest level of the Business Register statistical hierarchy. 2. In this table, a given enterprise could be in many years. 3. Business Innovation and Growth Support (BIGS) data includes a significant number of consulting services as well as enterprises in a consortium with no reported value of support. 4. Year-over-year comparisons should be made with caution. Year-over-year differences in the number of enterprises and support values may be the result of changes in departmental financial systems and the unavailability of data rather than changes to the programs. 5. An ultimate beneficiary enterprise is an enterprise that benefits from the activities of a program stream. The support to an ultimate beneficiary can be direct from a department or indirect through an intermediary. For a given program stream, an intermediary can not be an ultimate beneficiary. 6. The data source for revenue is the T2 Corporation Income Tax Return file. 7. An enterprise can be in only one revenue size category in the same year. 					

Table 4: Enterprises¹²³⁴ (ultimate beneficiary)⁵ with business innovation and growth support by industry size and year

NUMBER OF ENTERPRISES IN CANADA					
NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS)	2013	2014	2015	2016	2017
Agriculture, forestry, fishing and hunting	584	615	690	693	689
Mining, quarrying, and oil and gas extraction	374	363	385	389	370
Utilities	108	113	117	119	128
Construction	497	517	571	626	581
Manufacturing	4,477	4,689	5,121	5,213	5,024
Wholesale trade	1,585	1,696	1,737	1,773	1,675
Retail trade	490	591	625	633	614
Transportation and warehousing	233	243	276	275	266
Information and cultural industries	1,189	1,243	1,225	1,216	1,215
Finance and insurance	378	413	418	424	428
Real estate and rental and leasing	198	230	256	238	227
Professional, scientific and technical services	4,806	5,313	5,724	6,002	5,859
Management of companies and enterprises	407	387	404	384	412
Administrative and support, waste management and remediation services	487	490	517	538	493
Educational services	552	553	620	593	606
Health care and social assistance	195	236	275	280	278
Arts, entertainment and recreation	177	191	197	193	256
Accommodation and food services	123	122	156	121	133
Other services (except public administration)	961	939	953	1,020	1,006
Public administration	258	275	285	302	309
Unclassified ⁶	912	1,234	1,477	1,701	1,836

Source: Statistics Canada. Table 33-10-0221-01 Enterprises (ultimate beneficiary) with business innovation and growth support by industry and year

Notes:

1. This table shows only enterprises that were matched to the Business Register. Enterprise, as statistical unit, refers to the highest level of the Business Register statistical hierarchy.
2. In this table, a given enterprise could be in many years.
3. Business Innovation and Growth Support (BIGS) data includes a significant number of consulting services as well as enterprises in a consortium with no reported value of support.
4. Year-over-year comparisons should be made with caution. Year-over-year differences in the number of enterprises and support values may be the result of changes in departmental financial systems and the unavailability of data rather than changes to the programs.
5. An ultimate beneficiary enterprise is an enterprise that benefits from the activities of a program stream. The support to an ultimate beneficiary can be direct from a department or indirect through an intermediary. For a given program stream, an intermediary can not be an ultimate beneficiary.
6. The unclassified category includes enterprises with an unknown industry.

Table 5: Value of support to BIGS¹ non-funding intermediary enterprises^{2 3 4} by type of support, program stream and year⁵ (dollars)

TYPE OF SUPPORT	DEPARTMENT	PROGRAM STREAM NAME	YEAR OF SUPPORT ⁶										
			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Conditionally Repayable Contribution	CED: Economic Development Agency of Canada for the Regions of Quebec	New Business Development and Start-Ups	X	...	...	...	...	...	...	...	...	...	...
	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	X	...	...	...	...	...	...	...	...	...	...
Grant	CED: Economic Development Agency of Canada for the Regions of Quebec	Network Structuring	...	...	...	...	...	X	X	...	...	...	...
	NSERC: Natural Sciences and Engineering Research Council	Centres of Excellence for Commercialization and Research	\$104M	X	X	...	...	X	X	X	X	X	X
		Innovation Enhancement Grants	X	\$1M	\$10M	\$12M	\$16M	\$18M	\$16M	\$20M	\$19M	\$19M	\$18M
		Technology Access Centres Grants	...	...	...	...	\$2M	\$2M	\$4M	\$2M	\$6M	\$7M	\$7M
	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	X	X	X	\$12M	\$18M	X	X	X	X	X	X
Non-Repayable Contribution	CED: Economic Development Agency of Canada for the Regions of Quebec	Commercialization and Exports	...	\$2M	\$3M	\$5M	\$5M	\$5M	\$4M	\$5M	\$5M	\$4M	\$5M
		Community Futures Program - CED	\$23M	\$24M	\$24M	\$25M	\$24M	\$24M	\$24M	\$24M	\$25M	\$26M	X
		Innovation and Technology Transfer	X	\$3M	\$21M	\$23M	\$33M	\$35M	\$29M	\$24M	\$20M	\$24M	\$23M
		Network Structuring	...	X	\$2M	\$2M	\$2M	\$3M	X	\$1M	X	X	...
		New Business Development and Start-Ups	X	X	X	X	X	\$4M	X	X	X	X	...
		Productivity and Expansion	...	X	\$1M	\$1M	\$2M	\$2M	\$3M	\$3M	\$3M	\$2M	\$2M
	FedDev: Federal Economic Development Agency for Southern Ontario	Community Futures Program - FEDDEV	...	...	...	\$13M	\$12M	\$11M	\$11M	\$11M	\$11M	\$11M	\$11M
		Investing in Business Innovation	...	...	...	...	...	...	...	\$2M	\$2M	\$1M	\$3M
		Investing in Commercialization Partnerships	...	...	...	...	...	...	...	X	\$20M	\$34M	\$33M
		Investing in Regional Diversification	...	...	...	...	...	...	...	...	...	X	X
	ISED: Innovation, Science and Economic Development Canada	Community Futures Program - ISED	...	...	X	X	X	X	X	X	X	X	X
		Northern Ontario Development Program	...	X	X	X	...	...	X	X	X	X	...
	NRCan: Natural Resources Canada	Canada Accelerator and Incubator Program	...	...	...	...	...	...	...	\$10M	\$18M	\$24M	\$24M
		Industrial Research Assistance Program	...	\$8M	\$9M	\$7M	\$7M	\$17M	\$14M	\$12M	\$12M	\$13M	\$12M
	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	X	\$38M	X	X	X	X	X	X	X	X	X
Unconditionally Repayable Contribution	CED: Economic Development Agency of Canada for the Regions of Quebec	New Business Development and Start-Ups	...	X	X	X	X	...	...	...	...	...	...
	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	...	X	X	X	X	...	...	...	...	...	...
Other ⁷	CED: Economic Development Agency of Canada for the Regions of Quebec	New Business Development and Start-Ups	...	...	...	...	...	...	X	X	...	...	...
	FedDev: Federal Economic Development Agency for Southern Ontario	Investing in Commercialization Partnerships	...	...	...	...	...	...	...	...	\$M	\$M	\$M
	NSERC: Natural Sciences and Engineering Research Council	Innovation Enhancement Grants	...	...	\$M	\$M	\$M	\$M	\$M	\$M	\$M	\$M	\$M
	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	...	...	...	...	...	...	X	X	...	...	...
TOTAL (ALL TYPES)	TOTAL (ALL DEPARTMENTS)	TOTAL (ALL PROGRAM STREAMS)	\$129M	\$57M	\$86M	\$90M	\$107M	X	\$130M	\$130M	\$154M	\$174M	\$177M

Source: Statistics Canada, Centre for Special Business Projects (2020)

Notes

1. Business Innovation and Growth Support (BIGS) data includes a significant number of consulting services as well as enterprises in a consortium with no reported value of support.

2. This table shows only enterprises that were matched to the Business Register. "Enterprise", as a statistical unit, refers to the highest level of the Business Register statistical hierarchy.

3. An ultimate beneficiary enterprise is an enterprise that benefits from the activities of a program stream. The support to an ultimate beneficiary can be direct from a department or indirect through an intermediary. For a given program stream, an intermediary cannot be an ultimate beneficiary.

4. Some enterprises in this table are leads or members of a consortium. Consortia can be identified in the data when two or more enterprises are reported under the same project. Value of support of consortium members is set to 0 by design.

5. Year-over-year comparisons should be made with caution. Year-over-year differences in the number of enterprises and support values may be the result of changes in departmental financial systems and the availability of data rather than changes to the programs.

6. In this table, a single enterprise could be in many years and in many programs. "..." indicates "not applicable"; "X" indicates that the value is suppressed to meet the confidentiality requirements of the Statistics Act.

7. The type of support "Other" contains enterprises reported as consortium members and enterprises with missing type of support. Value of support of consortium members is set to 0.

Annex 11

Funding and Service Intermediaries by Department and Program (Based on 2018-19 Data)

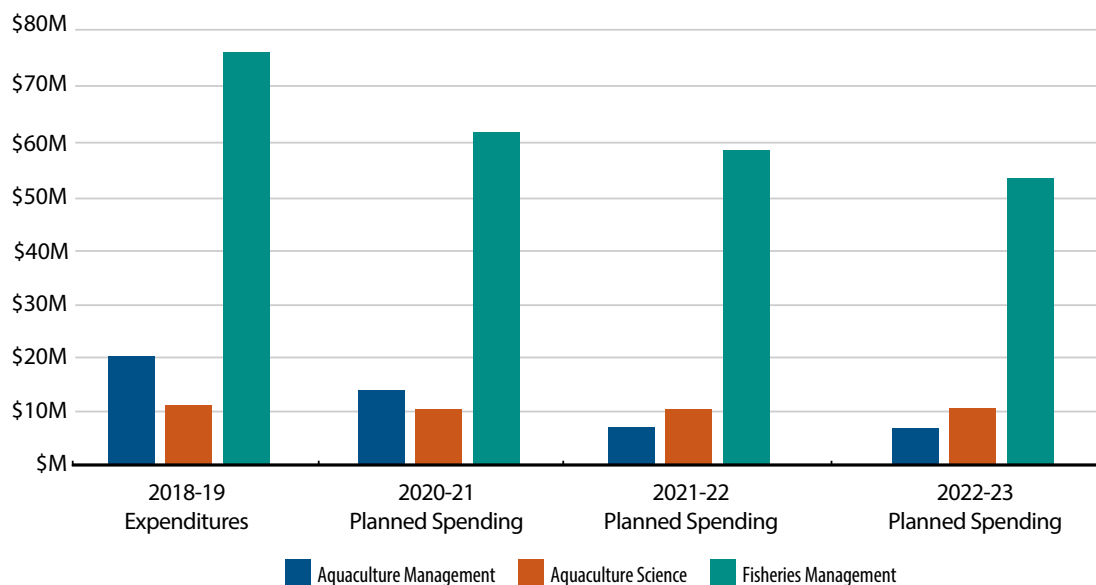
FUNDING INTERMEDIARIES		SERVICE INTERMEDIARIES	
DEPARTMENT	PROGRAM STREAM NAME	DEPARTMENT	PROGRAM STREAM NAME
ECCC: Environment and Climate Change Canada	Science Horizons Youth Internship Program	FedDev: Federal Economic Development Agency for Southern Ontario	Community Futures Program - FEDDEV
FedDev: Federal Economic Development Agency for Southern Ontario	Business Development and Community Innovation	FedDev: Federal Economic Development Agency for Southern Ontario	Investing in Business Innovation
FedDev: Federal Economic Development Agency for Southern Ontario	Collaborative Economic Development Projects	FedDev: Federal Economic Development Agency for Southern Ontario	Investing in Commercialization Partnerships
FedDev: Federal Economic Development Agency for Southern Ontario	Investing in Business Growth and Productivity	FedDev: Federal Economic Development Agency for Southern Ontario	Investing in Regional Diversification
FedDev: Federal Economic Development Agency for Southern Ontario	Investing in Business Innovation	ISED: Innovation, Science and Economic Development Canada	Community Futures Program - ISED
GAC: Global Affairs Canada	Canadian International Innovation Program	ISED: Innovation, Science and Economic Development Canada	Northern Ontario Development Program
ISED: Innovation, Science and Economic Development Canada	Futurpreneur Canada	NSERC: Natural Sciences and Engineering Research Council	Innovation Enhancement Grants
ISED: Innovation, Science and Economic Development Canada	Northern Ontario Development Program	NSERC: Natural Sciences and Engineering Research Council	Centres of Excellence for Commercialization and Research
NSERC: Natural Sciences and Engineering Research Council	Centres of Excellence for Commercialization and Research	NSERC: Natural Sciences and Engineering Research Council	Technology Access Centres Grants
NSERC: Natural Sciences and Engineering Research Council	Business-Led Network Centres of Excellence	NRC: National Research Council of Canada	Canada Accelerator and Incubator Program
NRCan: Natural Resources Canada	Green Jobs - Science and Technology Internship Program	NRC: National Research Council of Canada	Industrial Research Assistance Program

FUNDING INTERMEDIARIES		SERVICE INTERMEDIARIES	
DEPARTMENT	PROGRAM STREAM NAME	DEPARTMENT	PROGRAM STREAM NAME
NRCan: Natural Resources Canada	Green Jobs - Science and Technology Internship Program	NRC: National Research Council of Canada	Industrial Research Assistance Program
PCH: Department of Canadian Heritage	Experimental Stream	CED: Economic Development Agency of Canada for the Regions of Quebec	New Business Development and Start-Ups
PCH: Department of Canadian Heritage	New Musical Works	CED: Economic Development Agency of Canada for the Regions of Quebec	Network Structuring
ACOA: Atlantic Canada Opportunities Agency	Atlantic Innovation Fund	CED: Economic Development Agency of Canada for the Regions of Quebec	Commercialization and Exports
ACOA: Atlantic Canada Opportunities Agency	Business Development Program	CED: Economic Development Agency of Canada for the Regions of Quebec	Community Futures Program - CED
CanNor: Canadian Northern Economic Development Agency	Entrepreneurship and Business Development	CED: Economic Development Agency of Canada for the Regions of Quebec	Innovation and Technology Transfer
		CED: Economic Development Agency of Canada for the Regions of Quebec	Network Structuring
		CED: Economic Development Agency of Canada for the Regions of Quebec	Productivity and Expansion

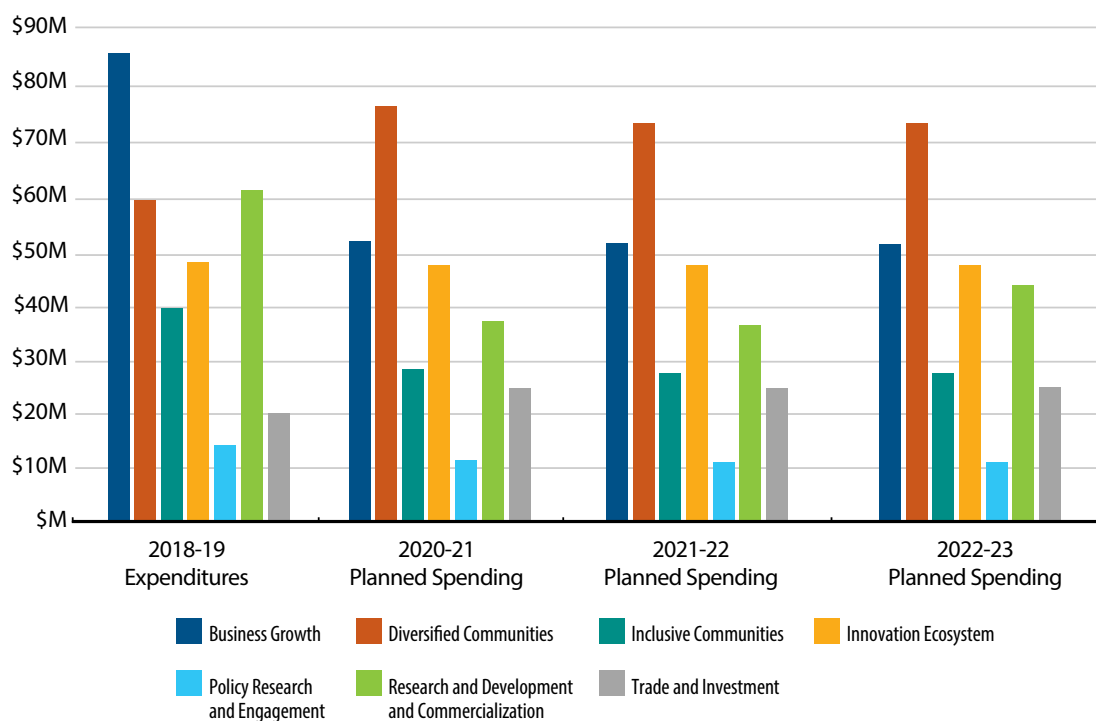
Annex 12

BIGS Program Expenditures and Planned Spending: DFO, ACOA, ISED

DFO BIGS Program Expenditures



ACOA BIGS Program Expenditures



ISED BIGS Program Expenditures

